FIFTH FIVE-YEAR REVIEW REPORT FOR VOGEL PAINT & WAX COMPANY SUPERFUND SITE SIOUX COUNTY, IOWA

Prepared by

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Date

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Appendices

List of Abbreviations & Acronyms

EPA	U.S. Environmental Protection Agency
IDNR	Iowa Department of Natural Resources
mg/L	milligram per liter
µg/L	microgram per liter
OU	operable unit

1.0 Introduction

The purpose of a five-year review, or FYR, is to evaluate the implementation and performance of a remedy to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency is preparing this five-year review pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act, or CERCLA, Section 121, consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (Title 40, Code of Federal Regulations, Section 300.430(f)(4)(ii)), and considering the EPA's policy.

This is the fifth FYR for the Vogel Paint & Wax Company Superfund Site, or Site. The triggering action for this statutory review is the completion date of the previous FYR, which was signed on September 10, 2014. The five-year review has been prepared due to the fact that hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure.

The Site consists of two operable units, or OUs. OU-01 addresses soil contamination and OU-02 addresses groundwater contamination.

The Vogel Paint & Wax Company Superfund Site FYR was led by Sandeep Mehta, EPA Region 7 Remedial Project Manager supported by the U.S. Army Corps of Engineers. The potentially responsible parties were notified of the initiation of the FYR. The review began on November 7, 2018.

Site Background

The Site is located approximately two miles south and one mile west of Maurice, Iowa (Appendix G, Figure 1). Vogel Paint & Wax Company (Vogel) is the owner of record. The Site is located in a rural, agricultural area that is characterized by scattered farmsteads. Land in the vicinity of the Site is primarily used for agricultural purposes, and, there are no indications of land use changing in the reasonably anticipated future at or near the Site.

The Vogel plant in nearby Orange City, Iowa generated waste that was disposed of at the Site from 1971 to 1979. Waste consisting of paint sludge, resins, solvents and other solid wastes were disposed of in the former gravel pit. The former gravel pit encompassedapproximately two acres, and was located in the west-central portion of the 80-acre property. The remainder of the Site was tilled for agricultural purposes.

1.1 Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Vogel Paint & Wax Company Superfund Site		
EPA ID: IAD980630487		
Region: 7	**State:** IA	**City/County:** Maurice/Sioux
SITE STATUS		
NPL Status: Final		
Multiple OUs? Yes	**Has the Site achieved construction completion?** Yes	
REVIEW STATUS		
Lead agency: State – Iowa Department of Natural Resources		
Author name (Federal or State Project Manager): Sandeep Mehta		
Author affiliation: EPA Remedial Project Manager		
Review period: 11/7/2018 – 5/17/2019		
Date of site inspection: 11/29/2018		
Type of review: Statutory		
Review number: 5		
Triggering action date: 9/10/2014		
Due date *(five years after triggering action date)*: 9/10/2019		

2.0 Response Action Summary

2.1 Basis for Taking Action

Hazardous substances that have been released in the soils at the Site include arsenic, cadmium, chromium (total), lead, and volatile organic compounds, or VOCs, from paint sludge, resins, solvents, and other solid wastes disposed of at the Site. Groundwater is currently contaminated with VOCs, including benzene, toluene, ethylbenzene, and xylene. Groundwater was contaminated with the VOCs methylene chloride, 1,2-dichloropropane, and methyl ethyl ketone; however, monitoring for these was discontinued prior to the previous FYR. Metals associated with the waste material have also been detected in groundwater.

Contaminated groundwater was determined to be a potential threat to drinking water supplies. Exposures to contaminants in soil, surface water, or air were not considered to be significant due to Site contaminants being covered with soil. Approximately 1,500 people, including the towns of Maurice and Struble and the Southern Sioux County Rural Water District have groundwater sources within a four-mile radius of the Site. The two nearest private residences are located approximately a quarter of a mile northwest and southwest of the active portion of the Site. The residences are served by the rural water district and no longer use private wells to supply water for domestic use. The private wells are currently being used for non-household purposes and analytical results indicate that they are not being impacted by the Site. The rural water district obtains water from shallow and deep wells located approximately a mile and a half southeast of the Site. The town of Maurice is also connected to rural water.

2.2 Response Actions

In 1979, the Iowa Department of Natural Resources, or IDNR, conducted initial investigations at the Site in response to concerns about a rural water district well field proposed approximately one-and one-half miles southeast of the Site. Vogel also conducted hydrogeologic investigations at the Site the same year.

In 1984, Vogel placed a 2-foot thick clay soil cap over the entire disposal area and the IDNR ordered Vogel to remove the floating VOCs from the water table. In June of 1987, Vogel entered into a consent order with IDNR for conducting a Remedial Investigation and Feasibility Study, or RI/FS, of the Site in accordance with the federal Superfund program.

2.2.1 Remedial Action Objectives

The Record of Decision, or ROD, signed on September 20, 1989, prescribed Remedial Action Objectives, or RAOs, for contaminated soils/solid waste and groundwater. The ROD was modified by an Explanation of Significant Differences, or ESD, in 1994, and another ESD in 2000. The 1989 ROD identified the following RAOs:

- Reduce migration of contaminants into groundwater by removal and/or treatment of the source, i.e. the contaminated soils/solid waste; and;
- Reduce contaminants in groundwater to established health-based standards for drinking water.

The health-based groundwater cleanup standards for drinking water as prescribed in Consent Order No. 2003-HC-02 in 2003, are presented in **Appendix F, Table 1**.

The 1994 ESD did not change the RAOs. The 2000 ESD clarified the RAO by specifying that the groundwater health-based standards must be achieved at the site boundary.

2.2.2 Remedy Components

In the 1989 ROD, the selected remedy for the affected soil included:

- Excavation of contaminated soils with solid and liquid waste separated for off-site incineration, recycling, or disposal.
- Treatment of an estimated 3000 cubic yards of contaminated soils using a bioremediation process in a fully contained surface impoundment unit. If additional testing showed bioremediation to be infeasible due to high metal levels, on-site thermal treatment would be implemented in its place.
- Treated soil would be stabilized if necessary to prevent leaching of metals, placed back into the excavation and covered.

The selected remedy for the affected groundwater included:

- Pumping and treating groundwater via air stripping with discharge to the nearby stream. Losses of volatile organics to the atmosphere in both the soil and groundwater actions would be controlled by carbon adsorption, if necessary.

As required by the ROD and as part of the remedy, the Site is listed on the State Abandoned and Uncontrolled Sites Registry. Substantial change or transfer of property on this registry is prohibited without written approval of the Director of the IDNR.

The July 1994 ESD described the differences in scope, performance, and cost between the original remedy described in the ROD and the modified remedy. The original remedy was modified to include:

- Five groundwater recovery wells;
- No treatment of the air stripper discharge;
- Increased free product removal through the addition of enhanced free product recovery equipment;
- Increased excavation and treatment of contaminated soils volume;
- Increased average and maximum concentrations of contaminants in soils;
- Clarified air quality standards;
- Clarified that one-fourth of the organic contaminants in soil would be treated by bioremediation with the remainder being lost to volatilization, based on the results of a treatability study;
- Increased the number of soil treatment beds to four one-acre beds; and,
- Confirmed the feasibility of bioremediation to treat metals-impacted soils and that treatment of the soils has not been necessary.

The October 2000 ESD prescribed these changes to the remedy:

- Revised the estimated amount of free product remaining;

- Modified the free product recovery to excavation of free product area, move those soils to intermediate depth, install lateral air piping, and conduct soil vapor extration/bioventing;
- Clarified criteria for compliance with groundwater standards, requiring chemical-specific applicable or relevant and appropriate requirements, or ARARs, be met at the site property boundary without additional active remedial measures;
- Replaced the state registry of Hazardous Waste or Hazardous Substance Disposal Sites as an institutional control with an environmental protection easement; and,
- Allowed for the pumping of treated groundwater back into the aquifer to facilitate free product removal in lieu of discharge to the unnamed creek.

The health-based groundwater cleanup standards for drinking water as prescribed in Consent Order No. 2003-HC-02 in 2003, are presented in **Appendix F, Table 1**.

2.3 Status of Implementation

The remedy for soils treatment consisted of landfarming; separation, stabilization and special placement of metals-contaminated soils; and backfilling the excavation with treated soils by landfarming. Excavation and treatment of soils began in October of 1991. The excavated area encompassed approximately two acres in the west-central portion of the Site. Soils were excavated to a depth of approximately 20 feet. As described in the ROD remedy above, the VOC contaminated soils were treated via on-site bioremediation using on-site landfarming cells, and soil stabilization for metals contaminated soils. The treated soils were placed back into the original disposal area and the excavation was covered with three feet of clean soil and one foot of topsoil. Soil remediation was completed in May of 1999. A Remedial Action Report certifying the completion of soil remediation was issued in September of 2000.

As the groundwater remedial activities, discussed below, progressed, it became apparent that a large volume of free product was present in subsurface soils in an area located to the south of the original disposal area. To address this source of groundwater contamination, excavation of an area approximately 500 feet by 200 feet by 35 feet deep was conducted between October 2000 and January of 2001. The non-contaminated shallow soils were placed at the bottom of the excavation and the contaminated soils from depth were placed on top. A system of ventilation pipes was placed through the repositioned contaminated soils to provide air to facilitate natural aerobic breakdown of contaminants (i.e., bioventing). These pipes were left in place; however no active ongoing bioventing is conducted.

Construction of the groundwater remediation system began in the spring of 1991 and normal operation of the system started in the spring of 1992. A Groundwater Remedial Action Report certifying the system as operational and functional was issued in October of 1994. Following a reduction in contaminant concentrations after the OU-01 soil remedial action in 2000, the IDNR allowed the groundwater treatment system to be shutoff in 2001. In July of 2003, data from additional monitoring wells revealed contaminated groundwater had migrated to the southern Site boundary and the remedial system was reactivated in August of 2003. Operation of the groundwater remediation system appeared to improve off-property groundwater conditions. Therefore, the use of the groundwater remediation system was again suspended after the seasonal shut-down in December of 2004. The groundwater pump and treat system remained inactive as the system appeared to improve off-property conditions, and in winter due to weather conditions. The groundwater treatment system was re-started in April 2016 after a

new shallow tray air stripper unit was installed. The groundwater treatment system was restarted to reduce the migration of contaminants from the source area.

In July of 2007, an irrigation/phytoremediation pilot study was initiated that included the planting of one acre of trees over the area that was excavated in late 2000. In 2008, an additional two- and one-half acres of trees were planted, expanding the phytoremediation system over the original disposal area where the stabilized metals-contaminated soils were placed. Vogel discontinued the phytoremediation pilot study in 2009 in consultation with the IDNR..

Further evaluation of additional remedial alternatives at the Site is on-going. A 2018 Pilot Study Work Plan examining the use of bioremediation to address contaminated groundwater had been prepared by Vogel and submitted to the IDNR and the EPA for review. This document was approved in May 2019. The intermediate goals of this Pilot Study are:

1. to determine the effectiveness of the technology to reduce the contaminants in the groundwater to below Maximum Contaminant Levels, or MCLs;
2. reduction of the contaminants in the groundwater to below MCLs at boundary wells, and prevent offsite migration from the property boundary;
3. locate the source area and determine the impacts of the bioremediation technology to reduce/impact the source;
4. determine the impacts on presence of metals in groundwater from the stabilized soils buried in the onsite landfill; and,
5. determine the groundwater/surface water interaction at the north end of the site property near the original source area.

The successful completion of the pilot study, should it be fully implemented, would provide the information needed to evaluate the current remedy effectiveness and whether a change to the remedy is necessary. As a part of the evaluation of the remedy effectiveness, evaluation of the RAOs for cleanup of the groundwater should also be addressed (See, "Summary of Key Existing EPA CERCLA Policies for Groundwater Restoration, June 26, 2009, OSWER Directive 9283.1-33").

The ROD required the site institutional controls as "continued listing and restrictions associated with the State Abandoned or Uncontrolled Sites Registry until no further threat remains". The site, as described in the deed notice registered by the IDNR with Sioux County, Iowa, via document # 29980 dated August 12, 2014,. Has been listed on the Iowa Registry for Hazardous Waste or Hazardous Substances Disposal sites since 1984. Subsequently, this property deed also incorporated a notice identifying the status of the Site as being on the Iowa Registry for Hazardous Waste or Hazardous Substances Disposal sites. The offsite area, where the plume has migrated from the property boundary, is not covered under the registry or the deed notice.

The 2000 ESD also recognized that the use of on-site groundwater for drinking water will be prohibited. The 2000 ESD also identified a different form of institutional control, environmental protection easement, may be utilized to replace the listing on Iowa Registry. In August 2017, the State of Iowa sent a letter to Vogel requesting that an environmental covenant, or EC, pursuant to Iowa Code 4551, be developed and implemented for the site since the Iowa Registry may be eventually rescinded. The Iowa Registry also does not prevent the use of on-site groundwater for drinking water. This EC is yet to be implemented.

2.4 Institutional Controls Summary Table

Table 2-1: Summary of Planned and/or Implemented ICs

Media	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Groundwater	Yes	Yes	Sitewide	Prohibit the use of on-site groundwater	Proprietary controls should be established on the property to implement land use restrictions that will prevent use of and exposure to contaminated on-site and off-site groundwater. This institutional control may take the form of an environmental covenant established pursuant to IC § 455I.
Soil and Groundwater	Yes	Yes	Sitewide	Prohibit a substantial change in use, sale, conveyance, or transfer of the property without written approval of the Director of the Iowa Department of Natural Resources	Iowa registry of Hazardous Waste or Hazardous Substance Disposal Sites (1984) and Deed Notice (2014)

2.5 Systems Operations/Operation and Maintenance

2.5.1 Systems Operations

The groundwater extraction system currently consists of one extraction well, RW-104, which is pumped at 5 gallons per minute. Groundwater recovery is completed by pumping groundwater from the extraction well to the treatment building where contaminated groundwater is treated using a shallow tray air stripper within the treatment building. Treated groundwater is pumped through an 8-inch pipe and discharged to the north end of the Site to a drainage channel/lagoon which is adjacent to the nearby creek (**Appendix G, Figure 1**). The current extraction system began pumping again on April 14, 2016 and pumped approximately 1.8 million gallons that year. Approximately 2.3 million gallons of groundwater were pumped and treated in 2017. For the year 2018, 2.7 million gallons of groundwater were pumped and treated.

2.5.2 Operation and Maintenance

There are no operation and maintenance requirements for any of the soils areas on-site.

No significant maintenance concerns were identified between system startup in 2016 and 2018. Nothing was identified during this review to indicate issues or future concerns with the maintenance of the

system. Weekly inspections of the extraction system are performed. Maintenance of the shallow tray air stripper and extraction wells are performed as needed.

3.0 Progress Since Last Review

This section includes the protectiveness determinations and statements from the last five-year review as well as the recommendations from the last five-year review and the current status of those recommendations.

Table 3-1: Protectiveness Determinations/Statements from the 2014 Five-year Review

OU #	Protectiveness Determination	Protectiveness Statement
01	Short-term Protective	"The OU-01 remedy is protective in the short term because there is no unacceptable exposure to human or ecological receptors from residually contaminated soils. However, to be protective in the long term, it is recommended that soil samples be collected in the bioventing area to evaluate progress of source remediation."
02	Short-term Protective	"The OU-02 remedy is protective in the short term because there is no unacceptable exposure to human or ecological receptors. However, to be protective in the long term, it is recommended that additional creek samples be collected to assure sediment and surface water samples remain at acceptable levels, and the groundwater plume needs to be effectively remediated and contained."

Table 3-2: Status of Recommendations from the 2014 Five-year Review

Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date
Groundwater has migrated off-property	Restart or reconstruct the existing groundwater treatment plant.	Completed	A shallow tray air stripper has replaced the original air stripper. The new extraction system currently pumps at 5 gallons per minute from RW-104 and has successfully reduced the size of the plume thereby indicating hydraulic capture of the plume.	4/14/2016
Lack of plan to assess uptake of contaminants in trees planted as part of the phytoremediation pilot study, particularly in the metal soils disposal area.	Develop a plan to assess the bioaccumulation/uptake of contaminants in phytoremediation trees, particularly those in the metal soils disposal area.	Completed	Vogel proposed and collected tree core samples from the phytoremediation trees which are mature and reported the findings in the 2013 and 2016 Annual Groundwater Monitoring Reports Trees within the metals disposal area are not yet mature enough to	6/30/2018

Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date
			allow for collection of core samples to evaluate contaminant uptake. Samples from mature trees did not show substantial uptake to indicate a significant exposure pathway is present. Although the metals disposal area trees have not been sampled, Vogel intends to assess the bioaccumulation of those trees when they have matured and report the findings in the annual report.	
Current groundwater monitoring program is not providing data to completely and accurately evaluate the levels of contamination and transport of metals from the metal soils disposal area.	Update the Groundwater Monitoring Plan to include collection of groundwater metal samples within the metals disposal area, collection of groundwater metals samples near the creek, collection of additional groundwater samples in the excavated soils areas, and changing sampling procedures to a more current sampling method.	Completed	See information below this table.	5/24/2019
Assess whether groundwater contamination is adversely impacting the intermittent stream that flows through the northern portion of the site.	Evaluate if the creek is being impacted by site contaminants through an assessment of the groundwater/surface water interaction, surface water sampling, and sediment sampling.	Addressed in Next FYR	Data presented in the 2017 Annual Groundwater Monitoring Report indicate an interaction between groundwater and surface water but does not show an adverse impact to the creek from Site contaminants. More sampling will be conducted.	Not Applicable

Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date
Property deed does not reference the status of the site on the Iowa State Registry for Hazardous Waste or Hazardous Substance Disposal Sites and needs to be documented in accordance with Iowa's Uniform Environmental Covenants Act.	Ensure the property deed contains reference to the site being on the Iowa State Registry for Hazardous Waste or Hazardous Substance Disposal Sites.	Completed	The property deed incorporated a notice which identifies the status of the Site as being on the Registry for Hazardous Waste or Hazardous Substances Disposal Sites (**Appendix I**).	8/18/2014

Three ground monitoring wells, or GMW, GMW-35, GMW-36, and GMW-37, were installed offsite from the property boundary in May 2014. These wells were installed to the south of GMW-30 to define the southern, downgradient extent of the groundwater contamination plume. Three additional monitoring wells, GMW-38, GMW-39 and GMW-40, were also installed offsite of the property boundary at the leading edge of the contaminant plume in February 2016. These wells were installed southeast, east, and northeast of GMW-30. To provide additional definition of the leading edge of the groundwater contaminant plume, three monitoring wells (GMW-41, GMW-42, and GMW-44) were installed offsite of the property boundary in early April 2016. A soil boring, SB-43, was also advanced at this time. GMW-41 was installed to the south of GMW-25 and west of GMW-38. GMW-42 was installed southeast of GMW-39 and GMW-44 was installed southeast of GMW-21 and GMW-22. The locations of the wells and soil boring are indicated on **Appendix G, Figure 1**.

The intent was to install a monitoring well at the SB-43 location, however during advancement of the boring it was noted that the boring was dry to 44.5 feet below ground surface and that the water-bearing sand present at most Site boring locations was not present at SB-43. The boring was left open for several days and remained dry, with no collapse of the hole. The boring was backfilled with bentonite.

Based on an agreement with the property owner, the six monitoring wells installed in 2016 were buried on April 14, 2016, to allow for planting of crops (corn in 2016). The risers for the wells were cut down and the wells were capped and buried. GPS location measurements were recorded at each well location to facilitate future locating. Following the corn harvest, the wells were located, risers extended, and measurement of water level and groundwater sampling completed during the winter months.

Four additional monitoring well locations are proposed at the northern portion of the Site to further define the lateral extent of the groundwater plume at the north end of the plume and to evaluate the possible migration of the north-end plume toward the creek.

4.0 Five-year Review Process

4.1 Community Notification, Involvement, and Site Interviews

4.1.1 Community Notification and Involvement

A public notice was made available by an advertisement in the Sioux County Capital-Democrat newspaper on September 27, 2018, stating that there was a five-year review and inviting the public to submit any comments to the EPA. The results of the review and the report will be made available via the EPA's internet-based information repository which can be accessed by the public through the following websites:

www.epa.gov/superfund/vogelpaintwax
https://semspub.epa.gov/src/collections/07/SC/IAD980630487

4.1.2 Site Interviews

During the five-year review process, interviews were conducted to document any perceived problems or successes with the remedy that has been implemented to date. The responses of these interviews are summarized below. A copy of the Interview Record is provided in **Appendix E, Interview Record**.

The IDNR Project Manager for this Site stated that Vogel has been responsive, cooperative, and proactive in remediating the Site. Several meetings have occurred during this five-year review period to discuss the Pilot Study Work Plan. The IDNR Project Manager has been well informed about the Site's activities and progress and has not received complaints related to the Site.

A representative from Vogel stated there is good communication between all stakeholders and the Site is slowing being remediated with a desire by Vogel to increase the speed to achieving the cleanup criteria. Vogel stated that the monitoring data is showing a decrease in contaminant levels, especially at the leading edge of the plume. Vogel or its engineering firm performs weekly site visits for routine sampling and maintenance of the extraction system.

A representative from the engineering firm which supports Vogel at the Site stated that Vogel has remained committed to achieving Site cleanup. Vogel's site representative asserted during the interview, as documented in Appendix F, that the current groundwater pump and treat system is functioning as intended by limiting downgradient migration from the source area. The bioremediation Pilot Study Work Plan is intended to help address source area contamination. Vogel's representative also asserted during the interview, as documented in Appendix F, that the contaminant plume has stabilized and that the downgradient extent of the plume decreased during this five-year review period.

4.2 Data Review

This five-year review included a review of relevant information contained in a variety of Vogel-related documents. Semi-annual and annual groundwater monitoring reports submitted from 2014 through 2018

for Vogel were the primary sources of data for this review although historical data were also considered. A list of site-related documents, reviewed in total or in part while performing this five-year review, is provided in **Appendix A**.

4.2.1 Free Product Recovery

Free product continues to be present at MW-4R **(Appendix G, Figure 1)**. This is the only well with measurable free product. Wells near MW-4R, including TC-2, TC-6D, TC-17, and GMW-11, are checked on a regular basis and have not shown free product. The area of free product appears to be limited and stable. However, it should be noted that these wells show concentrations of toluene, ethylbenzene and xylenes exceed 1% of their respective solubility limits which is presumptive evidence of source material/product at this portion of the site.

4.2.2 Tree Core Samples

Tree core samples were collected November 10, 2016, from poplar and willow trees that were planted over the area that was irrigated by RW-104 (southern section – 250 willows [Salix lutea Nutt.] and central section – 500 Imperial Carolina Poplars [Populus x canadensis Moench]. These trees were planted in 2007 and 2008. In general tree growth in the southern willow and central poplar tree planting areas had been steady (**Appendix G, Figure 2**).

Tree core samples were collected using a 10-inch HAGLÖF increment borer. Each core sample was collected from a height of approximately 5 feet (chest height) above ground. The collected tree core sample was of the outermost 3-inches (not including the bark) of the trunk.

Tree core samples were not collected from the poplar trees that were planted over the area irrigated by RW-102 (northern section – 1,800 Imperial Carolina Poplars). Tree growth in the northern poplar tree planting area has been inconsistent and smaller tree trunk diameters did not allow for consistent viable tree core sampling in 2016. Samples for studies may be taken in the future. However, the phytoremediation pilot study is no longer being pursued.

4.2.2.1 Metals Analysis

Tree cores were collected from 32 randomly-selected trees, four cores from eight areas/sections across the Site **(Appendix G, Figure 2)**. Eight composite samples made up of core samples from four trees each were submitted for analysis of arsenic, cadmium, chromium and lead.

Tree cores from Sections #1 and #2 were collected from willow trees only. Sections #3 through #8 were collected from poplar trees. The sample results are summarized in **Appendix F, Table 2**. The sample results for arsenic, cadmium, chromium and lead indicate absorption of metals by the trees at the Site. Comparison of arsenic, cadmium and chromium 2016 results with the 2013 results suggests increased arsenic and chromium uptake with tree growth. The cadmium uptake has remained steady. Trees were not sampled for lead in 2013.

4.2.2.2 Benzene, Toluene, Ethylbenzene and Xylenes Analysis

Tree cores were collected from eight trees, randomly selected from the eight sections across the southern and central tree planting areas. To provide proper sample mass to conduct the analyses, core samples were collected from three adjacent trees within each section and composited.

Sections #1 and #2 were collected from willow trees only. Sections #3 through 8 were collected from poplar trees. The sample results are summarized in **Appendix F, Table 2**. During the 2013 sampling event toluene and total xylenes concentrations in excess of laboratory reporting limits were detected in the composite sample collected from Section #7. Based on the 2016 sampling results, toluene and total xylenes were not detected in composite samples collected from Section #7 or the other seven sections.

4.2.3 Creek Assessment for Metals

Surface water and sediment sampling was completed on September 14, 2017. The collected water and sediment samples were submitted for laboratory analysis of total metals (arsenic, cadmium, chromium, lead, and mercury). **Appendix F, Table 3** summarizes the analytical results for the surface water and sediment samples collected during the 2017 sampling event and also includes previous surface water results. The locations where the surface water and sediment samples were collected are identified in **Appendix G, Figure 3**. The 2017 sample locations were selected to coincide with historical surface water sampling locations.

Based on analytical results from surface water sampling of the creek in September 2017, two detections of metals were noted - mercury in the on-site sample and arsenic in the downstream sample. The 2017 concentrations of these two metals are comparable to historical results and were well below the Iowa Surface Water Quality Standards.

Arsenic, chromium, and lead were detected in the upstream, on-site, and downstream sediment samples from the creek and mercury was detected in the on-site sediment sample only. Cadmium was not detected in any sediment sample. Downstream concentrations of arsenic and chromium were higher than upstream and on-site concentrations while the on-site concentrations were lower than downstream (**Appendix F, Table 3**). However, sediment concentrations are below ecological screening levels for sediment (Macdonald et al., 2000). Literature review indicates that arsenic, chromium, lead and mercury are ambient/natural to soils across Iowa (Rowden, 2010). For comparison with the metal concentrations detected in the creek sediments, **Appendix F, Table 3** also includes the mean concentrations of metals resulting from the referenced study.

The graph presented in **Appendix G, Figure 4** illustrates the interaction between groundwater and surface water of the creek. The flow of surface water in the creek is to the north. The groundwater gradient in this area of the Site is also to the north (**Appendix G, Figure 5**). The creek is an effluent stream, with the level of the surface water rising and falling with the groundwater table. At times, generally following precipitation events or during spring run-off, the surface-water elevation of the creek can be noted to be above the groundwater elevation in nearby wells.

4.2.4 Groundwater

Groundwater samples were collected semi-annually during this five-year review period. The current groundwater-monitoring schedule is included in **Appendix F, Table 4**.

4.2.4.1 Benzene, Toluene, Ethylbenzene and Xylene Compounds

Figures showing the current extent of benzene, toluene, ethylbenzene and xylene contamination in groundwater, generated from sample results collected in April 2018, are presented in **Appendix G, Figures 6** through **9**. Historical groundwater monitoring data for these compounds are presented in **Appendix F, Table 5**. A review of the April 2018 plume maps indicates that the plumes for benzene, toluene, and xylenes (as defined by the applicable MCLs) do not extend off-property. The ethylbenzene plume extends slightly off-property. The MCL for ethylbenzene was exceeded in two south Vogel property line wells (GMW-7R and GMW-20) and one off-property well (GMW-21). GMW-30 remains the furthest downgradient well with detectable ethylbenzene and xylene concentrations. Benzene, toluene, ethylbenzene and xylene concentrations were non-detect at all wells downgradient of GMW-30 (GMW-35 through GMW-39, GMW-41 and GMW-42) and also at side-gradient wells GMW-40 and GMW-44.

As part of the 2018 Annual Groundwater Monitoring Report, contaminant trend analysis was completed for eleven monitoring wells using ethylbenzene and xylenes data through 2018. The trend analysis graphs are provided in **Appendix H** and groundwater elevations are included on the graphs for reference. The 11 wells for which trend analyses graphs were completed are as follows: GMW-13, GMW-9R and TC-6D (source area); GMW-15, GMW-33, GMW-20, GMW-7R, and GMW-19 (downgradient, on Vogel property or property line); and GMW-21, GMW-25, and GMW-30 (downgradient, off-property).

Two trend analysis graphs, one using accumulated historical data and one using data from the five-year period between 2013 and 2018, are presented for each of the wells noted above for ethylbenzene and xylenes; xylenes only for GMW-19. Using data from the five-year period, two types of statistical trend analysis were performed: Mann-Kendall analysis and linear regression. The GSI Mann-Kendall Trend Analysis printouts are included with the graphs in **Appendix H**. A review of the results indicates that concentration trends over the past five years for ethylbenzene and xylenes were either stable or decreasing with the exception of xylenes at two wells (GMW15 & GMW-19) that exhibited no trend.

The plume delineation on the north end of the site has been relatively stable and well defined. In the recent sampling events, higher contaminant of concern, or COC, concentrations have been detected north of wells GMW-13, GMW-4, and GMW-3 in or near the former source area. An evaluation of the higher COC concentrations observed in these north wells shows these higher COC concentrations may be the result of the shift in the groundwater divide to the north from the recent precipitation events. The dirt road next to GMW-13 usually approximates the groundwater divide. The work to be conducted with the on-going Pilot Study intends to evaluate the apparent shift in the groundwater divide and subsequent migration of COCs to the north,as well as verification of the extent of the groundwater plume to the north.

Despite the concentration fluctuations that may occur as a result of groundwater elevation changes, it appears the extent of the plume is defined by the current monitoring well network.

4.2.4.2 Metals

Groundwater samples were collected from seven wells and submitted for laboratory analysis for metals (arsenic, cadmium, chromium, lead and mercury) during this five-year review period. The groundwater metals samples were collected from the following wells: GMW-13 (metals soil disposal area); TC-7 and GMW-4 (samples near creek); and GMW-7R, GMW-9R, GMW-15, and TC-6D. GMW-4, GMW-13, and TC-7 were added to the groundwater metals sampling program in 2015. **Appendix F, Table 6** summarizes the accumulated groundwater metals data for the Site. A review of the groundwater metals data does not indicate significant metals contamination at the Site. Over the past three years, MCLs for metals have not been exceeded at the Site.

4.2.4.3 Geochemical Data

Prior to 2016, groundwater samples were collected for nitrate, sulfate, ferrous iron, and methane. In 2016, ferric iron, filtered and total manganese, and alkalinity were added to the analyte list and have been sampled annually. During this FYR period, these samples were submitted for laboratory analysis. Prior to 2012, a Hach kit was used to estimate concentrations of nitrate, sulfate, and ferrous iron. During this FYR period, laboratory and field water quality parameters were collected annually at nine monitoring well locations to evaluate the effectiveness of natural attenuation, specifically biological degradation of benzene, toluene, ethylbenzene and xylene at the Site. Field water quality parameters are measured using a YSI meter and include temperature, pH, oxidation-reduction potential, conductivity, and dissolved oxygen. Yearly laboratory and field water quality parameter data for the nine monitoring wells are presented in **Appendix F, Table 7**. **Appendix F, Table 8** summarizes the field water quality parameter data accumulated from Site monitoring wells since 2009.

Degradation of Benzene, Toluene, Ethyl Benzene, and Xylene, or BTEX, compounds via biological processes may occur under aerobic or anaerobic conditions. Though there is some variability, the analytical results show that conditions within the on-site plume are generally anaerobic, while conditions elsewhere are generally aerobic. The evidence for these conclusions is outlined in the following evaluation of geochemical conditions, which is based on the *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents In Ground Water, EPA, 1998*:

1. Oxidation-reduction potential values have been generally negative within the source area and central portion of the contaminant plume, indicating anaerobic conditions, and generally positive in areas up gradient, side gradient, and downgradient, indicating aerobic conditions.
2. For dissolved oxygen, levels less than 0.5 milligrams per liter, or mg/L, represent anaerobic conditions, levels between 0.5 to 5 mg/L represent oxygen-deficient environments, and levels greater than 5 mg/L are aerobic. Dissolved oxygen values have generally been between 0.5 and 5 mg/L within the source area and central portion of the plume, indicating oxygen-deficient conditions, greater than 5 mg/L outside of these areas, indicating aerobic conditions.
3. Sulfate levels less than 20 mg/L are generally indicative of anaerobic conditions. While results have been highly variable, though generally greater than 20 mg/L, sulfate levels are usually higher outside the source area than within, indicating a change in geochemical conditions.
4. Nitrate levels less than 1 mg/L are generally indicative of anaerobic conditions. The results indicate that nitrate levels inside the source area and central portion of the plume are usually less

than 1 mg/L representing anaerobic conditions and greater than 1 mg/L outside the source area representing aerobic conditions.

5. Ferrous iron levels greater than 1 mg/L are generally indicative of anaerobic conditions. With the few exceptions, ferrous iron values have generally been less than 1 mg/L and do not appear to differentiate in geochemical conditions inside and outside the source area.
6. Alkalinity is due to the presence of carbon dioxide produced by metabolism of microorganisms. Alkalinity is elevated in the source area compared to outside of the source area.
7. Methane gas is typically generated under anaerobic conditions. Results show the highest concentration of methane present within the source area, with little to no methane in the upgradient and furthest downgradient monitoring wells.

4.2.5 Sampling Methods

The 2014 FYR Report included a recommendation to discontinue bailing as the groundwater sampling method in favor of low-flow purging or passive-diffusion bag sampling. Passive-diffusion bag groundwater sampling was conducted multiple times in 2015 and early 2016. Due to variability in passive-diffusion bag sample results, the 2016 Semi-Annual Groundwater Monitoring Report (GeoTek, 2016) included a recommendation to return to purge and bailer sampling. An additional round of passive-diffusion bag sampling was conducted on June 8, 2017, followed by bailing. Similar to previous sampling events, passive-diffusion bag sampling results were variable.

Low-flow sampling of a limited number of wells was completed on December 19, 2017. Sampling was conducted using a Grundfos Redi-Flow submersible pump. These wells had been sampled by bailing on December 12, 2017. The analytical results from the low-flow sampling event were generally comparable to those from the bailing sampling event, however bailing increases the potential for variability in analytical data and monitored natural attenuation parameters.

The current methods of sampling at the Vogel site include bailing where the wells are generally below-grade and hard to access, and low-flow sampling where the wells are easy to access.

4.3 Site Inspection

The inspection of the Site was conducted on November 29, 2018. In attendance were Sandeep Mehta and Jared Pessetto, EPA; Hylton Jackson, IDNR; three representatives from the U.S. Army Corps of Engineers; and three representatives from Vogel or their supporting firms. The Site inspection checklist is found in **Appendix D**.

The Site inspection assessed the overall maintenance of the Site, the surface integrity of the groundwater monitoring wells, extraction well, and the new shallow-tray air stripper. The inspection team observed the phytoremediation trees, the source areas, and the effluent discharge point. The team also observed the extraction well house for RW-104 and various monitoring wells within the plume, along the property boundary, and off-property. The site inspection did not include the bioventing system as it is not accessible. The daily maintenance activities were discussed. All equipment and monitoring wells were observed in good condition. Some minor nesting of field mice was observed in the extraction well housing which may present future maintenance issues if electrical wiring is chewed.

The inspection team observed the shallow-tray air stripper inside the treatment building as well as the associated piping and pumps. All of the mechanical equipment, electronics, and piping were in good condition with no concerns noted. No issues were identified during the Site inspection.

5.0 Technical Assessment

5.1 Question A: Is the remedy functioning as intended by the decision documents?

Question A Summary

The remedy is not functioning as intended. Site contamination, specifically ethyl benzene, remains above the MCL in offsite monitoring well GMW-21. However, the extraction well was returned to operation in April 2016 and data indicates that the system is regaining hydraulic control of the downgradient plume. The remedy for contaminated soil selected in the 1989 Record of Decision, or ROD, is complete and is functioning as intended. The bioventing piping system is in place but is not in use since 2000.

A Pilot Study Work Plan was approved in April 2019. The goals of the Pilot Study include: a) characterize the area of well MW-4R where free product is currently removed by bailing and install up to four groundwater extraction wells as needed for residual free product removal; 2) conduct a pilot test that evaluates use of bioremediation for contaminant mass reduction from the source area/on-site down-gradient area/off-site area; and, 3) conduct post-injection groundwater sampling and analysis to evaluate the effectiveness of the pilot action. The successful completion of the Pilot Study, should it be fully implemented, would provide the information needed to evaluate the current remedy effectiveness and whether a change to the remedy is necessary. As a part of the evaluation of the remedy effectiveness, evaluation of the RAOs for cleanup of the groundwater should also be addressed.

5.1.1 Remedial Action Performance

The remedial action objective of the soil remediation was to reduce migration of contaminants into groundwater by removal and/or treatment of the source. The soil remedial action selected in the 1989 ROD was completed in 1999 and removed approximately 71,000 gallons of solvent-related contamination by landfarming/bioremediation. An additional 220 barrels of paint sludge and liquid solvents were disposed of at an EPA approved disposal facility. As groundwater remedial activities progressed, it became apparent that a large volume of free product was present in subsurface soils in an area located to the south of the original disposal area. To address this contamination, between October 2000 and January of 2001, another area approximately 500 feet by 200 feet by 35 feet deep was excavated to remove free product that was acting as a source to groundwater BTEX contamination.

The free-product recovery system installed in MW-4R was discontinued in 2011 and replaced with monthly hand bailing in response to a decrease in free-product thickness. The ongoing free-product recovery component of the groundwater remedy is functioning as intended.

In 2007, a phytoremediation pilot study was initiated. From 2010 to 2016, the only groundwater remediation conducted was through phytoremediation and natural attenuation. According to the 2014 Five-year Review, trends showed that phytoremediation and natural attenuation were ineffective at reducing groundwater contaminant concentrations or in meeting the remedial action objective of preventing off-property migration. Vogel does not intend to actively continue the phytoremediation pilot study nor use the phytoremediation to remediate on-site contamination.

The original groundwater treatment remedy (i.e., groundwater extraction with treatment via air stripper)

was suspended in December of 2004 before being reactivated in April of 2016. The system now uses one extraction well, RW-104, and a shallow-tray air stripper. The current groundwater recovery and treatment system inhibits the migration of contaminants from the source area but detections of ethyl benzene in well GMW-21 show that contamination above cleanup levels exists outside of the property boundary. Metals have not been detected in groundwater above MCLs in the last three years.

5.1.2 System Operations/Operations and Maintenance

The soil remedy was completed in 2000 and there are no operation and maintenance requirements. After restarting in 2016, the groundwater extraction system has continued to operate as intended with minimal downtime during the winter months due to low temperatures. Maintenance clean outs of the shallow-tray air stripper occur regularly, as needed during the weekly inspections performed by Vogel. The inspection team noted that the equipment appeared to be well maintained. No issues or concerns with operation and maintenance were identified during the FYR.

5.1.3 Implementation of Institutional Controls and Other Measures

The institutional control prescribed by the 1998 ROD required listing the site on the state registry of Hazardous Waste or Hazardous Substance Disposal Sites. Listing on the state registry requires that sale or significant change in use of the property must be approved by the IDNR. Listing on the registry also prohibits the use of on-site groundwater. The Site has been on the state registry since 1984.

The 2000 ESD introduced environmental protection easements as an additional acceptable form of institutional control. The 2000 ESD explained that use of an environmental protection easement, or EPE, would enable more specific restrictions on land and groundwater use, and that the IDNR would accept the EPE in addition to or in lieu of the registry listing.

Vogel has not prepared an EPE for the property, however a deed notice was filed by the IDNR for the Site in 2014 **(Appendix I)**. The deed notice states that use of the property may not be changed substantially nor may the property be sold, conveyed, or transferred without the written approval of the Director of IDNR. These methods have proven effective and the institutional control portion of the remedy is functioning as intended. However, proprietary controls should be established on the property to implement land use restrictions that will prevent use of and exposure to contaminated on-site and off-site groundwater. This institutional control may take the form of an EC established pursuant to IC § 455I. A proprietary control of this sort will achieve the groundwater use restrictions on which the October 2000 ESD is premised.

5.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels and remedial action objectives used at the time of the remedy selection still valid?

Question B Summary

Exposure assumptions, toxicity factors, cleanup methods, and risk assessment methods were examined and there were no changes that would impact the protectiveness of the remedy. RAOs and specifically point of compliance are not consistent with the EPA groundwater guidance and will need to be revised/clarified before site completion.

5.2.1 Changes in Standards and To-Be-Considered Criteria

As summarized in **Appendix F, Table 9**, there have been no changes to the Iowa sitewide standards since the Consent Order. The Iowa sitewide standards for all the COCs, except methyl ethyl ketone, were derived from the federal primary MCLs; the methyl ethyl ketone site-wide standard is based on its lifetime Health Advisory Level. Monitoring for methyl ethyl ketone, methylene chloride, and 1,2-dichloropropane was discontinued prior to the last FYR (USACE, 2014) due to a lack of detections.

5.2.2 Changes in Toxicity and Other Contaminant Characteristics

Since no changes have occurred in the ARARs used to select the cleanup goals for the COCs still being monitored, consideration of changes in toxicity factors is not required.

5.2.3 Changes in Risk Assessment Methods

There have been a number of changes in risk assessment methods since the ROD (EPA, 1989a); however, none of these changes impact the protectiveness of the remedy.

5.2.4 Changes in Exposure Pathways

The vapor intrusion pathway was not considered in the 1980s for the original Remedial Investigation or in the Endangerment Assessment. Under current conditions, there is no potential exposure from subsurface vapor intrusion because no occupied buildings are located on the Site or above the off-property portion of the plume. Groundwater levels of ethyl benzene, toluene, and xylenes exceed 10,000 micrograms per liter, or µg/L, and thus could produce unacceptable risks if a building or residence were to be occupied on site.

The groundwater extraction system has not yet fully achieved on-site containment of the VOC plume. GMW-21 is the only off-property well with ethyl benzene and xylenes results of potential concern. Results from this well have been variable with no apparent trend. To evaluate the potential for vapor intrusion risks off-property, results of ongoing groundwater monitoring from June 8, 2016, to April 5, 2018 (except for an anomalously low set of results on June 8, 2017), shown in **Appendix F, Table 10**, were combined to generate an upper-bound estimate of the ethyl benzene and xylenes concentrations over that time period. Using the EPA's ProUCL 5.1 program (EPA, 2015a), 95% Upper Confidence Limits of 1,535 µg/L for ethyl benzene and 4,704 µg/L xylenes were calculated (**Appendix F, Table 11**). Using the EPA's Vapor Intrusion Screening Level Calculator (EPA, 2019), a cancer risk of 2×10^{-4} was calculated for ethylbenzene and a hazard quotient of six was calculated for xylenes, as shown in **Appendix F, Table 12**.

These results indicate that hypothetical residential receptors who might build homes in the area of GMW-21 could be exposed to a cancer risk exceeding the "acceptable" risk range of 10^{-6} to 10^{-4} from ethyl benzene and a hazard quotient of six from xylenes that would indicate adverse non-cancer health effects are also possible. However, recent EPA guidance on evaluating vapor intrusion from petroleum products (EPA, 2015b) suggests that petroleum products in the dissolved phase, such as ethyl benzene and xylenes in GMW-21, are unlikely to result in an unacceptable risk via the vapor intrusion pathway when the vertical separation distance between groundwater and an overlying structure is greater than six

feet. In the case of GMW-21, the depth to groundwater ranged from approximately 39 to 47 feet below ground surface as measured during sampling over the last 10 years.

There is no current exposure from the vapor intrusion pathway, and no land use change has occurred during this five-year period or is expected to occur in the future. Therefore, these results indicate that further migration of contaminants from this Site is unlikely to result in unacceptable risks via the vapor intrusion pathway.

Potential ecological risks at the site were not addressed in the original Remedial Investigation and Endangerment Assessment. Primary exposure pathways of ecological concern at the site are to organisms living in the intermittent creek, as well as wildlife that may consume the vegetation established as part of the phytoremediation pilot study. The most recent surface water and sediment data collected in 2017 indicates limited aquatic risk, as concentrations are non-detect or below ecological screening levels (Appendix, Table 3). Tree core sampling, which is ongoing, will provide data on chemical uptake, and can be used to evaluate potential ecological exposure to organisms consuming vegetation associated with phytoremediation at the site.

5.2.5 Remedial Action Objectives

The RAOs in the soil and groundwater, as identified in the ROD and ESDs, are still valid. However, the point of compliance for the RAO for the groundwater as defined in the October 2000 ESDs document is not consistent with the EPA guidance,."Summary of Key Existing EPA CERCLA Policies for Groundwater Restoration, June 26, 2009, OSWER Directive 9283.1-33". The successful completion of the Pilot Study, should it be fully implemented, would provide information needed to evaluate the current remedy effectiveness and whether a change to the remedy is necessary. As a part of the evaluation of the remedy effectiveness, evaluation of the RAOs for cleanup of the groundwater should also be addressed.

5.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

There have been no developments to indicate that new exposure pathways, new contaminants, unexpected byproducts of the remedy, or changes in Site conditions due to natural disasters or Site operations have been discovered that would call the protectiveness of the remedy into question.

6.0 Issues/Recommendations

Issues/Recommendations				
Issues and Recommendations Identified in the Five-Year Review:				
OU(s): OU 2	**Issue Category: Remedy Performance**			
	Issue: Although the current groundwater recovery and treatment system reduces the migration of contaminants from the source area, detections of ethyl benzene in two boundary wells show that contamination above cleanup levels has migrated off-property.			
	Recommendation: Additional efforts to reduce offsite migration and the overall plume footprint should be conducted. These efforts should also address removal of the remaining source area contaminants from the groundwater. The successful completion of the Pilot Study, should it be fully implemented, would provide information needed to evaluate the current remedy effectiveness and whether a change to the remedy is necessary. As a part of the evaluation of the remedy effectiveness, evaluation of the RAOs for cleanup of the groundwater should also be addressed.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	Vogel	IDNR/EPA	9/30/2023

Issues/Recommendations				
Issues and Recommendations Identified in the Five-Year Review:				
OU(s): OU 2	**Issue Category: Institutional Controls**			
	Issue: The October 2000 ESD established that "the use of on-site groundwater for drinking water will be prohibited." Current institutional controls on the property do not achieve this prohibition because Iowa's Registry of Hazardous Waste Disposal Sites does not enable specific enforceable land use restrictions.			
	Recommendation: Proprietary controls should be established on the property to implement land use restrictions that will prevent use of and exposure to contaminated on-site groundwater. This institutional control may take the form of an environmental covenant established pursuant to IC § 455I. A proprietary control of this sort will achieve the groundwater use restrictions on which the October 2000 ESD is premised, enhancing the long-term protectiveness of the remedy.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	Vogel	IDNR/EPA	12/31/2021

6.1 Other Findings

- The Groundwater Monitoring Plan should be updated to include a current sampling method. It is recommended that low-flow sampling be implemented at the Site to reduce data variability caused by bailing which disturbs the groundwater and resuspends solids. This will allow better observations of subsurface conditions for biodegradation and monitored natural attenuation..
- The current groundwater monitoring program is not providing data to completely and accurately evaluate the levels of contamination and transport of metals from the metal soils disposal area. Update the Groundwater Monitoring Plan to include collection of groundwater metal samples within the three metals disposal areas, collection of groundwater metals samples near the creek, and collection of additional groundwater samples in the excavated soils areas.
- The point of compliance defined in the October 2000 ESD appears to be inconsistent with Iowa's state-wide classification of drinking water aquifers and the EPA's expectation to return groundwater to beneficial uses wherever practicable. This issue needs to be further evaluated between the EPA, IDNR, and Vogel.

7.0 Protectiveness Statements

Sitewide Protectiveness Statement	
Protectiveness Determination: Short-term Protective	*Planned Addendum Completion Date:* N/A
Protectiveness Statement: The remedy at the Vogel Paint & Wax Company Superfund Site currently protects human health and the environment because the off-property portion of the plume does not show any current exposure to vapor intrusion; and there is no on-site use of contaminated groundwater. In order to be protective in the long term, additional efforts to reduce offsite migration and the plume footprint should be conducted. These efforts should also address removal of the remaining source area contaminants from the groundwater. In addition, the on-site enforceable institutional control to prevent use of groundwater should be implemented.	

8.0 Next Review

The next FYR report for the Vogel Paint & Wax Company Superfund Site is required five years from the completion date of this review.

APPENDICES

APPENDIX A

REFERENCE LIST

EPA, 1989. Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual, (Part A, Supplemental Guidance for Dermal Risk Assessment), Final. United States Environmental Protection Agency. EPA/540/1-89/002.

EPA, 2004. Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual, (Part E, Supplemental Guidance for Dermal Risk Assessment), Final. United States Environmental Protection Agency. OSWER Directive 9285.7-02EP.

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EPA, 2009. Risk Assessment Guidance for Superfund. Volume I: Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment). United States Environmental Protection Agency. EPA-540-R-070-002.

EPA, 2014. Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors. United States Environmental Protection Agency. Office of Solid Waste and Emergency Response. OSWER Directive 9200.2-120. February.

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EPA, 2015b. Technical Guide for Addressing Petroleum Vapor Intrusion at Leaking Underground Storage Tank Sites. United States Environmental Protection Agency. Office of Underground Storage Tanks. EPA 510-R-15-001. June.

EPA, 2019. Vapor Intrusion Screening Level Calculator at URL: https://epa-visl.ornl.gov/cgi-bin/visl_search

GeoTek Engineering & Testing Services, Inc. (GeoTek), 2000. Work Plan for Excavation of Free Product Plume and Bioventing of the Contaminated Soils, Maurice, Iowa. October.

GeoTek, 2014a. 2013 Annual Groundwater Monitoring Report, Vogel Paint & Wax Co. Site, Maurice, Iowa. April.

GeoTek, 2014b. 2014 Semi-Annual Groundwater Monitoring Report, Vogel Paint & Wax Co. Site, Maurice, Iowa. August.

GeoTek, 2015a. 2014 Annual Groundwater Monitoring Report, Vogel Paint & Wax Co. Site, Maurice, Iowa. May.

GeoTek, 2015b. 2015 Semi-Annual Groundwater Monitoring Report, Vogel Paint & Wax Co. Site, Maurice, Iowa. June.

GeoTek, 2015c. Addendum to the 2014 Annual Groundwater Monitoring Report, Vogel Paint and Wax Company Superfund Site, Maurice, Iowa. September.

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GeoTek, 2016a. 2015 Annual Groundwater Monitoring Report, Vogel Paint & Wax Co. Site, Maurice, Iowa. April.

GeoTek, 2016b. 2016 Semi-Annual Groundwater Monitoring Report, Vogel Paint & Wax Co. Site, Maurice, Iowa. August.

GeoTek, 2017a. Addendum to the 2016 Semi-Annual Groundwater Monitoring Report, Vogel Paint and Wax Company Superfund Site, Maurice, Iowa. March.

GeoTek, 2017b. 2016 Annual Groundwater Monitoring Report, Vogel Paint & Wax Co. Site, Maurice, Iowa. June.

GeoTek, 2017c. 2017 Semi-Annual Groundwater Monitoring Report, Vogel Paint & Wax Co. Site, Maurice, Iowa. August.

GeoTek, 2018a. 2017 Annual Groundwater Monitoring Report, Vogel Paint & Wax Co. Site, Maurice, Iowa. May.

GeoTek, 2018b. Updates on Recommendations from the Fourth Five-Year Review Report, Vogel Paint and Wax Company Superfund Site, Maurice, Iowa. May.

GeoTek, 2018c. Addendum to 2017 Semi-Annual Report & 2017 Annual Report, Vogel Paint and Wax Company Superfund Site, Maurice, Iowa. June.

GeoTek, 2018d. 2018 Semi-Annual Groundwater Monitoring Report, Vogel Paint & Wax Co. Site, Maurice, Iowa. July.

Geotek, 2018e. Metals Contamination Technical Memorandum, Vogel Paint and Wax Company Superfund Site, Maurice, Iowa. July.

GeoTek, 2018f. Addendum to 2018 Semi-Annual Groundwater Monitoring Report, Vogel Paint and Wax Company Superfund Site, Maurice, Iowa. September.

IDNR, 1989. Record of Decision, Vogel Wax and Paint Company Site, Maurice, Iowa. September.

IDNR, 1994. Explanation of Significant Differences, Vogel Wax and Paint Company Site, Maurice, Iowa. July.

Ohio EPA, 2014. Reduction-Oxidation (Redox) Control in Ohio's Ground Water Quality, Division of Drinking and Ground Waters Technical Series on Ground Water Quality.

Ramboll, 2018. Work Plan for Additional Groundwater Characterization North of the Former Source Area, Vogel Paint & Wax Co. Site, Maurice, Iowa. July.

APPENDIX B

SITE CHRONOLOGY

EVENT	DATE
Site discovery by the state following concerns expressed by nearby residents about rural water wells in the vicinity of the waste disposal area.	Spring 1979
Site proposed for the National Priorities List.	10/15/1984
Final listing on the National Priorities List.	06/10/1986
An IDNR Consent Order (No. 87-SW-16) was signed by the IDNR and potentially responsible party (i.e., Vogel) requiring completion of a remedial investigation/feasibility study (RI/FS).	06/08/1987
RI/FS completed and Record of Decision (ROD) issued.	09/20/1989
The IDNR RI/FS Consent Order was amended (IDNR Amended Consent Order No. 90-HC-10) to implement the remedial design and remedial action as prescribed in the ROD.	07/23/1990
Groundwater remediation was begun with start-up of groundwater recovery and treatment system.	Spring 1991
Soil remediation was begun with treatment of first batch of contaminated soils in soil treatment cell.	Fall 1991
Remedial Action Report for Groundwater indicating the groundwater actions to be operational and functional.	10/28/1992
An Explanation of Significant Differences (ESD) was issued that increased the scope of cleanup actions with more recovery wells, a larger estimate on free product removal, a larger excavation and treatment volume of soil, higher maximum concentration of contaminants in soils based on testing results, use of an open system for bioremediation of contaminated soils, additional soil treatment beds, as well as removal of Iowa proposed Air Toxics Rules as an ARAR and removal of a carbon adsorption unit to treat the air discharge from the air stripper design.	07/20/1994
Preliminary Close-Out Report.	08/19/1994
First Five-Year Review completed.	10/1/1998
Remedial Action Report for Soil Remediation Operable Unit indicating completion of soil remediation activities.	9/28/2000
A second ESD was issued which prescribed additional efforts to enhance free product removal to expedite groundwater remediation. The ESD described the efforts which included excavation and repositioning of contaminated soil, with subsequent operation of an SVE/bioventing system. The ESD also clarified the criteria to determine if, and when, discontinuation of active groundwater remediation was warranted.	10/2000
Enhanced free-product excavation, repositioning of contaminated soil, and installation of vent pipes completed.	01/2001
An IDNR Consent Order (No. 2003-HC-02) between the IDNR and Vogel replaced prior Consent Order No. 90-HC-10 and clarified remaining actions necessary to complete remedial measures prescribed in the ROD and ESDs.	05/23/2003
In accordance with the 2003 Consent Order, groundwater remediation system was placed in standby mode (i.e., not reactivated in spring 2003 following winter shutdown) pending groundwater monitoring results.	Spring 2003
Off-property groundwater contamination discovered and, in accordance with the 2003 Consent Order, the groundwater remediation system re-activated.	08/2003

Second Five-Year Review completed	09/24/2004
Normal seasonal shutdown of pumping to the air stripping tower, due to stable or decreasing concentrations in the southern monitoring wells, the extraction system was not reactivated in the spring of 2005.	12/2004
Phytoremediation/irrigation pilot study approved by the IDNR and initiated of a 1-acre area.	6/2007
Phytoremediation area expanded to include an additional 2.5 acres north of the 2007 planting, including over the original disposal area where metals contaminated soils were placed.	5/2008
Third Five-Year Review completed.	09/24/2009
Sampling and reporting in the Annual Report of bioaccumulation of Site contaminants within the phytoremediation trees.	04/2014
Property deed updated to include a notice which identifies the status of the Site as being on the Registry for Hazardous Waste or Hazardous Substances Disposal Sites.	08/18/2014
Fourth Five-Year Review completed.	09/10/2014
Due to increasing concentrations in off-property wells, a shallow tray air stripper was installed and began operation to replace the original air stripper which could not be re-activated.	04/2016
Sampling and reporting in the Annual Report of bioaccumulation of Site contaminants within the phytoremediation trees.	06/2017
Draft Pilot Study Work Plan for Enhancement of Groundwater Remediation developed by Vogel and submitted to the EPA and IDNR for review.	01/28/2019

APPENDIX C

PHYSICAL CHARACTERISTICS

1.0 Physical Characteristics

The Vogel site is located on land generally described as the W ½ of the NW ¼ of Section 29, T94N, R45W, Sioux County, Iowa **(Appendix C, Figure 1)**. The Vogel Paint and Wax Company is the owner of record. The site is approximately two miles south and one mile west of Maurice, Iowa, and is accessible from a gravel road on the west side of the site. Remedial activities at the site have been concentrated in the southern half of the 80-acre property. The site is located in a rural, agricultural area that is characterized by scattered farmsteads. The two nearest private residences are located about a quarter of a mile northwest and southwest of the active portion of the site.

The Vogel site lies in the Dissected Till Plains Region of the Central Lowland Physiographic Province. The region is characterized by gently rolling topography originating from the weathering of glacial till materials which overlay bedrock of Cretaceous age. A small, unnamed tributary runs from west to east through the north side of the site. The West Branch of the Floyd River is located approximately a half mile east of the site. Two sand formations underlie the site separated by a low permeability glacial till. Groundwater in the thin upper sand unit generally flows to the north following the topography. Groundwater in the lower sand unit generally flows to the south. The two sand formations merge in the subsurface area near the old disposal trenches and groundwater from the upper sand unit reverses flow as it drains into the lower aquifer.

Surface soil consists of a 5 to 17-foot layer of clayey silt loess. The upper sand thickness ranges from 1 to 10 feet. Glacial till that separates the upper sand unit from the lower sand unit ranges in thickness from 17 to 20 feet and the lower sand and gravel unit ranges in thickness from 7 to 15 feet. A second glacial till unit acts as it lower confining unit. Depth to groundwater ranges from 7 feet below ground surface (bgs) at the north end of the Site to between 25 and 33 feet bgs in the main portion of the property. Depths to water at downgradient off-site wells ranges from 23 to 43 feet bgs.

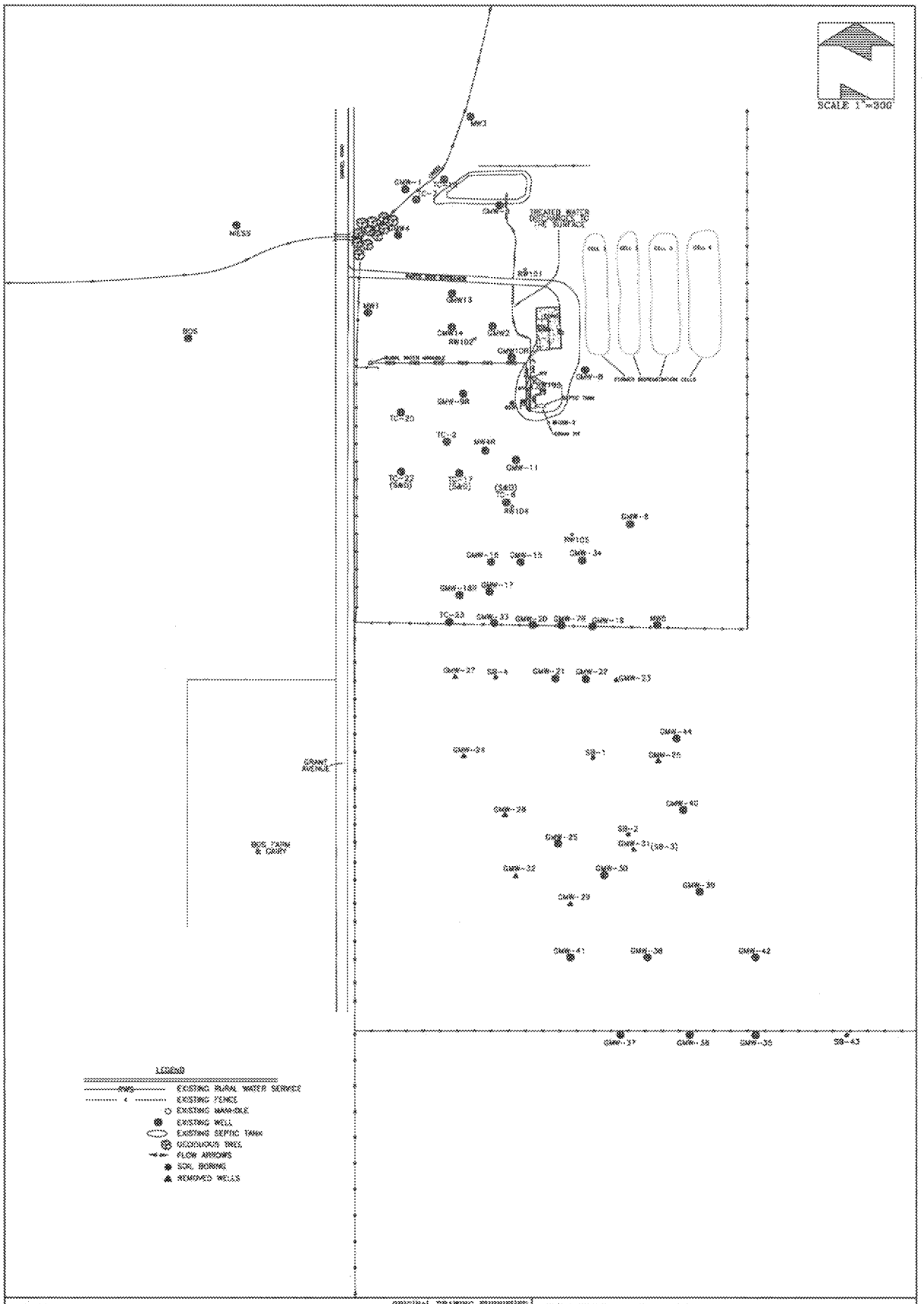

FIGURE 1
SITE MAP
VOGEL PAINT WASTE SITE
MAURICE, IOWA

ORIGINAL DRAWING FURNISHED BY DGR & ASSOCIATES CO.

ACAD\GEOTEK\SEPTIC\91-400

PROJECT #: 91-400

DRAWN BY: JLS CHECKED BY:

GEOTEK ENGINEERING & TESTING SERVICES, INC.

APPENDIX D

SITE INSPECTION CHECKLIST

Site Inspection Checklist

I. SITE INFORMATION	
Site name: Vogel Paint & Wax Company Superfund Site	**Date of inspection:** 29 November 2018
Location and Region: Maurice, Sioux County/U.S. EPA Region 7	**EPA ID:** IAD980630487
Agency, office, or company leading the five-year review: U.S. EPA Region 7	**Weather/temperature:** Partly Cloudy/Low 30s

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☒ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other:
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☒ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager**

Name Title Date

Interviewed ☐ at site ☐ at office ☐ by phone Phone no. .....

Problems, suggestions; ☐ Report attached .....

.....

2. **O&M staff**

Name Title Date

Interviewed ☐ at site ☐ at office ☐ by phone Phone no. .....

Problems, suggestions; ☐ Report attached .....

.....

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____

4. **Other interviews** (optional) ☐ Report attached.

All interviews will be conducted via email after the site inspection.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - ☐ O&M manual — ☐ Readily available — ☐ Up to date — ☒ N/A
   - ☐ As-built drawings — ☐ Readily available — ☐ Up to date — ☒ N/A
   - ☒ Maintenance logs — ☒ Readily available — ☒ Up to date — ☐ N/A

   Remarks

2. **Site-Specific Health and Safety Plan** — ☐ Readily available — ☐ Up to date — ☒ N/A
   - ☐ Contingency plan/emergency response plan — ☐ Readily available — ☐ Up to date — ☒ N/A

   Remarks

3. **O&M and OSHA Training Records** — ☐ Readily available — ☐ Up to date — ☒ N/A

   Remarks

4. **Permits and Service Agreements**
   - ☐ Air discharge permit — ☐ Readily available — ☐ Up to date — ☒ N/A
   - ☐ Effluent discharge — ☐ Readily available — ☐ Up to date — ☒ N/A
   - ☐ Waste disposal, POTW — ☐ Readily available — ☐ Up to date — ☒ N/A
   - ☐ Other permits _____ — ☐ Readily available — ☐ Up to date — ☒ N/A

   Remarks Effluent requirements are prescribed in the decision documents in accordance with state standards.

5. **Gas Generation Records** — ☐ Readily available — ☐ Up to date — ☒ N/A

   Remarks

6. **Settlement Monument Records** — ☐ Readily available — ☐ Up to date — ☒ N/A

   Remarks

7. **Groundwater Monitoring Records** — ☒ Readily available — ☒ Up to date — ☐ N/A

   Remarks

8. **Leachate Extraction Records** — ☐ Readily available — ☐ Up to date — ☒ N/A

   Remarks

9. **Discharge Compliance Records**
   - ☐ Air — ☐ Readily available — ☐ Up to date — ☐ N/A
   - ☒ Water (effluent) — ☒ Readily available — ☒ Up to date — ☐ N/A

   Remarks

10. **Daily Access/Security Logs** — ☐ Readily available — ☐ Up to date — ☒ N/A

    Remarks

IV. O&M COSTS (Costs not reviewed as part of the Five-Year Review)

1. **O&M Organization**
   - ☐ State in-house
   - ☐ Contractor for State
   - ☐ PRP in-house
   - ☒ Contractor for PRP
   - ☐ Federal Facility in-house
   - ☐ Contractor for Federal Facility
   - ☐ Other _____

2. **O&M Cost Records**
   - ☐ Readily available ☐ Up to date
   - ☐ Funding mechanism/agreement in place
   - Original O&M cost estimate NA ☐ Breakdown attached

   Total annual cost by year for review period if available

   From _____ (Date) To _____ (Date) _____ (Total cost) ☐ Breakdown attached
   From _____ (Date) To _____ (Date) _____ (Total cost) ☐ Breakdown attached
   From _____ (Date) To _____ (Date) _____ (Total cost) ☐ Breakdown attached
   From _____ (Date) To _____ (Date) _____ (Total cost) ☐ Breakdown attached
   From _____ (Date) To _____ (Date) _____ (Total cost) ☐ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs During Review Period**
   Describe costs and reasons: The original groundwater treatment plant has not been used for remediation since 2004. A smaller scale, shallow tray air stripper was installed and began operation in April 2016.

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☐ Gates secured ☒ N/A
   Remarks: Fencing is not required as an IC, however, the site does maintain a gate and property fencing, all of which were in good condition.

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☒ N/A
   Remarks _____

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☒ No ☐ N/A

Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by): Deed restrictions

Frequency _____

Responsible party/agency _____

Contact _____ _____ _____

Name Title Date Phone no.

Reporting is up-to-date ☐ Yes ☐ No ☒ N/A

Reports are verified by the lead agency ☐ Yes ☐ No ☒ N/A

Specific requirements in deed or decision documents have been met ☒ Yes ☐ No ☐ N/A

Violations have been reported ☐ Yes ☐ No ☒ N/A

Other problems or suggestions: ☐ Report attached

The property deed has been updated to reflect the status of the site on the Iowa State Registry for Hazardous Waste or Hazardous Waste Substance Disposal Sites.

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks: _____

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident

Remarks _____

2. **Land use changes on site** ☒ N/A

Remarks _____

3. **Land use changes off site** ☒ N/A

Remarks _____

VI. GENERAL SITE CONDITIONS

A. Roads ☐ Applicable ☒ N/A

1. **Roads damaged** ☐ Location shown on site map ☐ Roads adequate ☐ N/A

Remarks _____

B. Other Site Conditions

Remarks _____

_____

_____

_____

_____

VII. LANDFILL COVERS ☐ Applicable ☒ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ Settlement not evident
   Areal extent _____ Depth _____
   Remarks _____

2. **Cracks** ☐ Location shown on site map ☐ Cracking not evident
   Lengths _____ Widths _____ Depths _____
   Remarks _____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
   Areal extent _____ Depth _____
   Remarks _____

4. **Holes** ☐ Location shown on site map ☐ Holes not evident
   Areal extent _____ Depth _____
   Remarks _____

5. **Vegetative Cover** ☐ Grass ☐ Cover properly established ☐ No signs of stress
   G Trees/Shrubs (indicate size and locations on a diagram)
   Remarks _____

6. **Alternative Cover (armored rock, concrete, etc.)** ☐ N/A
   Remarks _____

7. **Bulges** ☐ Location shown on site map ☐ Bulges not evident
   Areal extent _____ Height _____
   Remarks _____

8. **Wet Areas/Water Damage** ☐ Wet areas/water damage not evident
- ☐ Wet areas ☐ Location shown on site map Areal extent _____
- ☐ Ponding ☐ Location shown on site map Areal extent _____
- ☐ Seeps ☐ Location shown on site map Areal extent _____
- ☐ Soft subgrade ☐ Location shown on site map Areal extent _____

Remarks _____

9. **Slope Instability** ☐ Slides ☐ Location shown on site map ☐ No evidence of slope instability
Areal extent _____
Remarks _____

B. Benches ☐ Applicable ☐ N/A
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** ☐ Location shown on site map ☐ N/A or okay
Remarks _____

2. **Bench Breached** ☐ Location shown on site map ☐ N/A or okay
Remarks _____

3. **Bench Overtopped** ☐ Location shown on site map ☐ N/A or okay
Remarks _____

C. Letdown Channels ☐ Applicable ☐ N/A
(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** ☐ Location shown on site map ☐ No evidence of settlement
Areal extent _____ Depth _____
Remarks _____

2. **Material Degradation** ☐ Location shown on site map ☐ No evidence of degradation
Material type _____ Areal extent _____
Remarks _____

3. **Erosion** ☐ Location shown on site map ☐ No evidence of erosion
Areal extent _____ Depth _____
Remarks _____

4. **Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ ☐ No obstructions
☐ Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
☐ No evidence of excessive growth
☐ Vegetation in channels does not obstruct flow
☐ Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations ☐ Applicable ☐ N/A

1. **Gas Vents** ☐ Active ☐ Passive
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance
☐ N/A
Remarks_____

2. **Gas Monitoring Probes**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____

4. **Leachate Extraction Wells**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A
Remarks_____

E. Gas Collection and Treatment ☐ Applicable ☐ N/A

1. **Gas Treatment Facilities**
   ☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
   ☐ Good condition ☐ Needs Maintenance
   Remarks _____

2. **Gas Collection Wells, Manifolds and Piping**
   ☐ Good condition ☐ Needs Maintenance
   Remarks _____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   ☐ Good condition ☐ Needs Maintenance ☐ N/A
   Remarks _____

F. Cover Drainage Layer ☐ Applicable ☐ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A
   Remarks _____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A
   Remarks _____

G. Detention/Sedimentation Ponds ☐ Applicable ☐ N/A

1. **Siltation** Areal extent _____ Depth _____ ☐ N/A
   ☒ Siltation not evident
   Remarks _____

2. **Erosion** Areal extent _____ Depth _____
   ☐ Erosion not evident
   Remarks _____

3. **Outlet Works** ☐ Functioning ☐ N/A
   Remarks _____

4. **Dam** ☐ Functioning ☐ N/A
   Remarks _____

II. Retaining Walls ☐ Applicable ☐ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident
   Horizontal displacement _____ Vertical displacement _____
   Rotational displacement _____
   Remarks _____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident
   Remarks _____

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ☐ N/A

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident
   Areal extent _____ Depth _____
   Remarks _____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A
   ☐ Vegetation does not impede flow
   Areal extent _____ Type _____
   Remarks _____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
   Areal extent _____ Depth _____
   Remarks _____

4. **Discharge Structure** ☐ Functioning ☐ N/A
   Remarks _____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident
   Areal extent _____ Depth _____
   Remarks _____

2. **Performance Monitoring** Type of monitoring _____
   ☐ Performance not monitored
   Frequency _____ ☐ Evidence of breaching
   Head differential _____
   Remarks _____

IX. GROUNDWATER/SURFACE WATER REMEDIES ☒ Applicable ☐ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ☒ Applicable ☐ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   ☒ Good condition ☒ All required wells properly operating ☐ Needs Maintenance ☐ N/A
   Remarks: All wells which were inspected were observed to be in good condition. There were no problems reported in the latest Annual Groundwater Monitoring Report.

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ☒ Good condition ☐ Needs Maintenance
   Remarks _____

3. **Spare Parts and Equipment**
   ☒ Readily available ☒ Good condition ☐ Requires upgrade ☐ Needs to be provided
   Remarks _____

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☒ N/A

1. **Collection Structures, Pumps, and Electrical**
   ☐ Good condition ☐ Needs Maintenance
   Remarks _____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ☐ Good condition ☐ Needs Maintenance
   Remarks _____

3. **Spare Parts and Equipment**
   ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
   Remarks _____

C. Treatment System ☒ Applicable ☐ N/A

1. **Treatment Train** (Check components that apply)

☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
☒ Air stripping ☐ Carbon adsorbers
☐ Filters
☐ Additive (e.g., chelation agent, flocculent)
☐ Others
☒ Good condition ☒ Needs Maintenance
☒ Sampling ports properly marked and functional
☒ Sampling/maintenance log displayed and up to date
☒ Equipment properly identified
☒ Quantity of groundwater treated annually 2.3 million gallons
☐ Quantity of surface water treated annually

Remarks: The new shallow tray air stripper operates at 5 gallons per minute. A bioremediation pilot study using phytoremediation has been operating at the site since 2007, however, the pilot study will be discontinued. A new enhanced bioremediation pilot study is being proposed and designed by the Vogel Paint and Wax Company.

2. **Electrical Enclosures and Panels** (properly rated and functional)

☐ N/A ☒ Good condition ☐ Needs Maintenance

Remarks

3. **Tanks, Vaults, Storage Vessels**

☒ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs Maintenance

Remarks

4. **Discharge Structure and Appurtenances**

☐ N/A ☒ Good condition ☐ Needs Maintenance

Remarks

5. **Treatment Building(s)**

☐ N/A ☒ Good condition (esp. roof and doorways) ☐ Needs repair
☐ Chemicals and equipment properly stored

Remarks Field mice were observed in the enclosure for RW104 which could lead to future maintenance issues from wiring being chewed. The main treatment building is in good condition.

6. **Monitoring Wells** (pump and treatment remedy)

☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A

Remarks Not all monitoring wells were inspected. The extraction wells and wells along the plume were inspected.

D. Monitoring Data

1. Monitoring Data

☒ Is routinely submitted on time ☒ Is of acceptable quality

2. Monitoring data suggests:

☒ Groundwater plume is effectively contained ☒ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1.	**Monitoring Wells** (natural attenuation remedy) ☐ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☐ Good condition ☐ All required wells located ☐ Needs Maintenance ☐ N/A Remarks: Monitored Natural Attenuation parameters is currently being sampled and reported although a decision document has not been formally approved to document the inclusion as a formal remedy.

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).
The shallow tray air stripper was installed and began operation in April 2016 and has shown to be effective in recapturing the off-site plume and reducing the plume to nearly entirely on-site. Additionally, the property deed has been updated to reflect the status of the site on the Iowa State Registry for Hazardous Waste or Hazardous Waste Substance Disposal Sites to meet compliance with the Institutional Control remedy.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.
O&M at the Site appears to be diligently performed and adequate for the remedy. Some minor nesting of field mice in recovery well enclosures were observed which could lead to maintenance issues in the future, however this does not impact the protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.
Significant progress has been made to resolve issues identified in the previous Five-Year Review. The groundwater extraction and treatment system has effectively captured the plume and reduced concentrations to below action levels on all off-site wells for all site contaminants which are sampled except for one, GMW-21.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.
No opportunities for optimization were identified during the site inspection.

Site Inspection Team Roster		
Personnel	**Representing**	**Phone Number**
Sandeep Mehta	U.S. EPA Region 7	913-551-7763
Brad Brink	U.S. Army Corps of Engineers, Kansas City District	816-389-3883
Kenneth Kamp	U.S. Army Corps of Engineers, Kansas City District	816-389-3642
Conrad Bonney	U.S. Army Corps of Engineers, Kansas City District	816-389-2386

Five-year Review Site Inspection
Vogel Paint and Wax Company
~~X Month 2018~~ 29 November 2018
Sign-in Sheet

Please sign in beneath your printed name and verify existing information. Please provide any missing information

Personnel	Title	Representing	Phone Number
Sandeep Mehta	Remedial Project Manager	U.S. EPA Region 7	913-551-7763
Brad Brink	Hydrogeologist	U.S. Army Corps of Engineers, Kansas City District	816-389-3883
Kenneth Kamp	Technical Lead	U.S. Army Corps of Engineers, Kansas City District	816-389-3642
Conrad Bonney	Civil Engineer	U.S. Army Corps of Engineers, Kansas City District	816-389-2386
Keith DeLange	Sr. Proj. Mgr.	GeoTek Engineering	605-335-5512
Danielle Schreiber	Outside Counsel	Vogel	202-828-1233
Scott Heemstra	Dir of Mfg	Vogel	712.707.9740
Hylton Jackson	Environmental Spec.	Iowa DNR	515 725 8338
Jared Persetto	Atty-Advisor	EPA	913-551-7793

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Five-year Review Site Inspection
Vogel Paint and Wax Company
X Month 2018
Sign-in Sheet

Please sign in beneath your printed name and verify existing information. Please provide any missing information

Personnel	Title	Representing	Phone Number

APPENDIX E

INTERVIEW RECORD

Form for state contacts and local authorities

INTERVIEW RECORD

Site Name: Vogel Paint and Wax Company	**EPA ID No.:** IAD980630487
Subject: Fifth Five-year Review	**Time:** **Date:**
Type: ☐ **Telephone** ☐ **Visit** ☐ **Other** **Location of Visit:** Site location, Maurice, Iowa	☐ **Incoming** ☐ **Outgoing**

Contact Made By

Name: Kenneth Kamp	**Title:** Technical Lead	**Organization:** U.S. Army Corps of Engineers

Individual Contacted

Name: Hylton Jackson	**Title:** State Project Manager	**Organization:** Iowa DNR
Telephone No.: 515 725 8338 **E-mail Address:** Hylton.Jackson@dnr.iowa .gov	**Street Address:** 502 East 9th Street **City, State, Zip Code:** Des Moines, IA 50319	

Summary of Conversation

1. What is your overall impression of the project?

The RP, Vogel, has been responsive and cooperative during the extended remedial history at the site. Recently, Vogel has proactively initiated a plan for a site-wide pilot project of enhanced bioremediation for the property. The Iowa DNR and EPA are in the process of approving the pilot project.

2. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please give the purpose and results.

There have been several meetings. The Iowa DNR and EPA met with representatives of Vogel on May 14th and 15th, 2018to discuss remedial options and requirements. The Iowa DNR, USACE, and EPA attended the 5YR kickoff meeting (on-site) with Vogel on November 29th, 2018. The Iowa DNR and Vogel representative met with EPA in at Region VII offices in Lenexa, KS on December 12th to discuss the pilot study work plan proposals.

3. Have there been any complaints, violations, or other incidents related to the site requiring a response by your office? If so, give the details of the events and the results of the responses.

No

4. Do you feel well informed about the sites' activities and progress?

Yes

5. Do you have any comments, suggestions, or recommendations regarding the sites' management or operation?

The site was listed on the NPL (1986) and the ROD was signed in 1989. A 1990 Memorandum of Agreement between the Iowa DNR and EPA established the State of Iowa as the lead agency with EPA serving in a support role. The exact relationship between lead agency and support agency has never been clearly defined. In the past, there have been occasional differences between the two regulatory agencies on site management. The Iowa DNR would just like to respectfully request that EPA occasionally reevaluate the level of management detail warranted by an agency operating in a support role.

Form for O&M contractor and remedial design/remedial action consultant

INTERVIEW RECORD

Site Name: Vogel Paint and Wax Company		**EPA ID No.:** IAD980630487	
Subject: Fifth Five-year Review		**Time:**	**Date:**
Type: ☐ **Telephone** ☐ **Visit** ☐ **Other** **Location of Visit:**		☐ **Incoming** ☐ **Outgoing**	
Contact Made By			
Name:	**Title:** Technical Lead	**Organization:** U.S. Army Corps of Engineers	
Individual Contacted			
Name: Keith DeLange	**Title:** Sr. Project Manager	**Organization:** GeoTek Engineering	
Telephone No.: 605.335.5512 **E-mail Address:** kdelange@geotekeng.com		**Street Address:** 909 East 50th Street North **City, State, Zip Code:** Sioux Falls, SD 57104	

Summary of Conversation

1. What is your overall impression of the project?
My overall impression of the project is that Vogel remains committed to bringing the project to closure.

2. Is the remedy functioning as expected? How well is the remedy performing?
The current groundwater pump and treat system (shallow tray air stripper) is functioning as expected. The system is limiting downgradient movement of contaminants from the source area. Vogel has submitted a bioremediation pilot study plan intended to better address source area contamination.

3. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? Increasing?
Monitoring data shows that over the past 5 years, the contaminant plumes are stable. Contaminant levels are decreasing at the downgradient extent of the plume.

4. Is there a continuous on-site O&M presence? If so, describe the staff and activities. If not, describe staff and frequency of site inspections and activities.
There is not a continuous on-site O & M presence. GeoTek personnel complete weekly sampling of influent/effluent from the pump and treat system. Vogel personnel are at the site approximately every week to week and a half to clean trays for the air stripper system.

5. Have there been any significant changes in the O&M requirements, maintenance schedules, or sampling routines since start up? If so, do they affect the protectiveness or effectiveness of the remedy? Describe changes and impacts.
For the current groundwater pump and treat system, there have been no significant changes in the O & M requirements, maintenance schedules, or sampling routines.

6. Have there been unexpected O&M difficulties or costs at the site since start-up or in the last five years?
No.

7. Have there been opportunities to optimize O&M or sampling efforts? Describe changes and resultant or desired cost savings or improve efficiency.
When possible, GeoTek combines the weekly influent/effluent sampling visits with other sampling at the site or with other projects in the vicinity of the site, to reduce costs for Vogel.

8. Do you have any comments, suggestions, or recommendations regarding the project?
None.

Form for O&M contractor and remedial design/remedial action consultant

INTERVIEW RECORD

Site Name: Vogel Paint and Wax Company		**EPA ID No.:** IAD980630487	
Subject: Fifth Five-year Review		**Time:**	**Date:**
Type: **Telephone** **Visit** **Other** **Location of Visit:**		**Incoming** **Outgoing**	
Contact Made By			
Name:	**Title:** Technical Lead	**Organization:** U.S. Army Corps of Engineers	
Individual Contacted			
Name: Scott Heemstra	**Title:** Dir of Mfg	**Organization:** Vogel Paint	
Telephone No.: 712.737.4993 **E-mail Address:** scott.heemstra@vogelpaint.com		**Street Address:** 1020 Albany Place SE **City, State, Zip Code:** Orange City, IA 51041	

Summary of Conversation

1. What is your overall impression of the project?
Site is stable and in a slowly improving state. There appears to be good communication between Vogel, IDNR and EPA.

2. Is the remedy functioning as expected? How well is the remedy performing?
Overall, yes. However, there is a desire to speed the remedy up.

3. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? Increasing?
Monitoring data shows that overall contaminant levels are decreasing, especially at the leading edge of the plume.

4. Is there a continuous on-site O&M presence? If so, describe the staff and activities. If not, describe staff and frequency of site inspections and activities.
No, there is not a continuous on-site presence. Weekly visits are performed by Geotek Engineering to measure influent/effluent of the water treatment system. In addition, at least every two weeks, and frequently, every week, someone from Vogel Paint is on site to perform maintenance on the shallow-tray stripper and other grounds maintenance.

5. Have there been any significant changes in the O&M requirements, maintenance schedules, or sampling routines since start up? If so, do they affect the protectiveness or effectiveness of the remedy? Describe changes and impacts.
Yes, if you compare to the startup from 28 years ago. Since the last 5-year review, the only significant change is the addition of the shallow-tray system. To my knowledge, the protectiveness or effectiveness is not changed or impacted.

6. Have there been unexpected O&M difficulties or costs at the site since start-up or in the last five years?
No.

7. Have there been opportunities to optimize O&M or sampling efforts? Describe changes and resultant or desired cost savings or improve efficiency.
No comment.

8. Do you have any comments, suggestions, or recommendations regarding the project?
None.

APPENDIX F

TABLES

Table 1: Vogel Paint & Wax Cleanup Standards	
Contaminant	Groundwater Cleanup Standard (mg/L) statewide standards from consent order
Arsenic	0.01
Chromium (total)	0.1
Cadmium	0.005
Lead	0.015
Benzene	0.005
Ethylbenzene	0.7
MEK	4.0
Toluene	1
Xylenes	10
1,2-Dichloropropane	0.005
Methylene Chloride	0.005

Analysis no longer conducted due to lack of contaminant detections

Table 2: Tree Core Analytical Results

Metals

Sample ID	Sample Date	Arsenic (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Lead (mg/kg)
Section #1	11/20/2013	0.012	0.784	0.452	
Section #1	11/10/2016	0.164	0.778	0.515	0.009 J
Section #2	11/20/2013	0.013	0.957	0.876	
Section #2	11/10/2016	0.175	0.706	0.579	0.018
Section #3	11/20/2013	0.010	0.598	0.237	
Section #3	11/10/2016	0.123	0.420	1.01	0.015
Section #4	11/20/2013	0.008	0.572	0.178	
Section #4	11/10/2016	0.123	0.486	0.820	0.013 J
Section #5	11/20/2013	0.011	0.641	0.216	
Section #5	11/10/2016	0.129	0.484	0.863	0.008 J
Section #6	11/20/2013	0.008	0.436	0.211	
Section #6	11/10/2016	0.150	0.320	0.224	0.011 J
Section #7	11/20/2013	0.007	0.469	0.248	
Section #7	11/10/2016	0.147	0.328	0.364	0.027
Section #8	11/20/2013	0.008	0.543	0.267	
Section #8	11/10/2016	0.146	0.257	0.745	0.232

BTEX

Sample ID	Sample Date	Benzene (µg/Kg)	Toluene (µg/Kg)	Ethylbenzene (µg/Kg)	Total Xylenes (µg/Kg)
Section #1	11/20/2013	ND	ND	ND	ND
Section #1	11/10/2016	ND	ND	ND	ND
Section #2	11/20/2013	ND	ND	ND	ND
Section #2	11/10/2016	ND	ND	ND	ND
Section #3	11/20/2013	ND	ND	ND	ND
Section #3	11/10/2016	ND	ND	ND	ND
Section #4	11/20/2013	ND	ND	ND	ND
Section #4	11/10/2016	ND	ND	ND	ND
Section #5	11/20/2013	ND	ND	ND	ND
Section #5	11/10/2016	ND	ND	ND	ND
Section #6	11/20/2013	ND	ND	ND	ND
Section #6	11/10/2016	ND	ND	ND	ND
Section #7	11/20/2013	ND	**1250**	ND	**2320**
Section #7	11/10/2016	ND	ND	ND	ND
Section #8	11/20/2013	ND	ND	ND	ND
Section #8	11/10/2016	ND	ND	ND	ND

ND = not detected above laboratory reporting limit

TABLE 3 -STREAM ANALYTICAL DATA
VOGEL PAINT WASTE SITE
GEOTEK #91-400

SURFACE WATER DATA

DATE	LOCATION	ARSENIC	CADMIUM	CHROMIUM	LEAD	MERCURY	NOTE
	*SWQS**	*0.15000*	*0.00045*	*0.01100*	*0.00770*	*0.00090*	
Creek Samples							
11/06/09	Up Stream	<0.0100	<0.0010	<0.0100	<0.0100	<0.0010	
01/13/11	Up Stream	0.00142	<0.0005	0.00231	<0.0040	<0.0002	
02/16/11	Up Stream	0.00337	<0.0005	<0.0020	<0.0040	**0.00106**	
09/27/11	Up Stream	0.00132	<0.0005	<0.0020	<0.0040	<0.0002	
09/14/17	Up Stream	<0.0020	<0.0005	<0.0050	<0.0005	<0.0002	
11/06/09	On Site	<0.0010	<0.0100	<0.0010	<0.0010	<0.00005	IDNR Split Sample
11/06/09	On Site	<0.0100	<0.0010	<0.0100	<0.0100	<0.0010	
01/13/11	On Site	0.01730	**0.00295**	**0.02230**	**0.02760**	0.00020	
02/16/11	On Site	0.00302	<0.0005	<0.0020	<0.0040	**0.00163**	
09/27/11	On Site	0.00123	<0.0005	<0.0020	<0.0040	<0.0002	
09/14/17	On Site	<0.0020	<0.0005	<0.0050	<0.0005	0.000216	
11/06/09	Down Stream	<0.0100	<0.001	<0.01	<0.01	<0.001	
01/13/11	Down Stream	<0.00100	<0.0005	<0.00200	<0.00400	<0.00020	
02/16/11	Down Stream	0.00377	<0.0005	0.00225	<0.0040	**0.00182**	
09/27/11	Down Stream	0.00152	<0.0005	<0.0020	<0.0040	<0.0002	
09/14/17	Down Stream	0.00202	<0.0005	<0.0050	<0.0005	<0.0002	

* Iowa Surface Water Quality Standards
Bold indicates standard exceeded
Results in mg/L

SEDIMENT DATA

DATE	LOCATION	ARSENIC	CADMIUM	CHROMIUM	LEAD	MERCURY
09/14/17	Up Stream	5.34	<1.13	17.0	12.6	<0.0194
09/14/17	On Site	5.13	<0.945	17.5	17.9	0.0239
09/14/17	Down Stream	7.75	<0.988	21.6	10.9	<0.0185
Mean of shallow samples*		7.76	1.01	33.03	20.72	0.03
Mean of deep samples*		9.24	1.00	33.63	21.00	0.03

Results in mg/kg
*From "The Iowa State-Wide Trace Element Soil Sampling Project: Design and Implementation"
shallow soil samples 0 - 8", deep soil samples 12 - 24"

TABLE 4

VOGEL PAINT AND WAX COMPANY
DISPOSAL SITE NEAR MAURICE, IOWA

SITE MONITORING PLAN
(Proposed for 2018)

GROUNDWATER MONITORING SCHEDULE

Location	Semi-Annual	Annual	Parameters
MW-1		X	BTEX, MNA parameters
MW-5		X	BTEX, MNA parameters
GMW-3		X	BTEX
GMW-4		X	BTEX, Metals
GMW-7R	X		BTEX, Metals, MNA parameters
GMW-8		X	BTEX
GMW-9R	X		BTEX, Metals, MNA parameters
GMW-10R	X		BTEX
GMW-11		X	BTEX
GMW-13		X	BTEX, Metals, MNA parameters
GMW-14		X	BTEX
GMW-15	X		BTEX, Metals
GMW-16		X	BTEX
GMW-17		X	BTEX
GMW-18R		X	BTEX
GMW-19	X		BTEX
GMW-20	X		BTEX
GMW-21	X		BTEX, MNA parameters
GMW-22		X	BTEX
GMW-25	X		BTEX, MNA parameters
GMW-30	X		BTEX, MNA parameters
GMW-33	X		BTEX
GMW-34	X		BTEX
GMW-35	X		BTEX, MNA parameters
GMW-36	X		BTEX
GMW-37	X		BTEX
GMW-38	X		BTEX
GMW-39	X		BTEX
GMW-40	X		BTEX
GMW-41	X		BTEX
GMW-42	X		BTEX
GMW-44	X		BTEX
TC-6D	X		BTEX, Metals
TC-7		X	BTEX, Metals
TC-17D		X	BTEX
TC-22D		X	BTEX
TC-23		X	BTEX

Metals analysis for Arsenic (As), Cadmium (Cd), Chromium (Cr), Lead (Pb) and Mercury (Hg)
MNA – Monitored Natural Attenuation
Metals and MNA Parameters sampled annually

Table 5 GROUNDWATER ANALYTICAL DATA (µg/L) VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
3/24/2004	GMW-1	<2	<2	<2	<5	1280.31
6/25/2004	GMW-1	<2	<2	<2	<5	1280.48
9/27/2004	GMW-1	<2	<2	<2	<5	1281.05
12/14/2004	GMW-1	<2	<2	<2	<5	1280.23
3/16/2005	GMW-1	<2	<2	<2	<5	1279.77
6/20/2005	GMW-1	<2	<2	<2	<5	NA
12/22/2005	GMW-1	<2	<2	<2	<5	1278.92
11/19/2007	GMW-1	<2	<2	<2	<5	1280.36
2/28/1996	GMW-2	19	**3090**	**15000**	**33200**	1274.32
9/30/1996	GMW-2	<20	290	**2330**	9280	1276.62
8/27/1997	GMW-2	<20	**2360**	**15200**	**42200**	NA
8/27/1997	GMW-2	<20	**1930**	**10600**	**26400**	NA
3/20/1998	GMW-2	12	**7380**	**10900**	**26800**	1278.74
3/27/2001	GMW-2	<2	76	**1420**	**16900**	1284.74
10/4/2001	GMW-2	<20	170	**1090**	9260	1283.32
12/14/2001	GMW-2	<20	106	298	3580	1284.54
3/29/2002	GMW-2	<2	144	**920**	4990	1284.81
6/27/2002	GMW-2	<20	114	**960**	4610	1283.98
9/26/2002	GMW-2	<20	160	**1350**	7130	NA
12/11/2002	GMW-2	<20	504	**2370**	**11920**	NA
5/14/2008	GMW-2	<2	<2	<2	<5	1279.85
8/7/2008	GMW-2	<2	<2	<2	<5	1279.66
8/27/2008	GMW-2	<2	<2	<2	<5	1278.98
10/27/2008	GMW-2	<2	<2	<2	<5	1279.54
5/12/2009	GMW-2	<2	<2	<2	<3	NA
7/8/2009	GMW-2	<2	<2	<2	<3	1279.78
9/17/2009	GMW-2	<2	5	19	87	1278.74
1/18/2018	GMW-2 (bail)	<2	<2	<2	<6	1279.62
3/24/2004	GMW-3	<2	<2	<2	<5	1279.41
6/25/2004	GMW-3		<2	<2	<5	NA
9/27/2004	GMW-3	<2	<2	<2	<5	1283.04
12/14/2004	GMW-3	<2	<2	<2	<5	1281.47
3/16/2005	GMW-3	<2	<2	<2	<5	1279.40
6/20/2005	GMW-3	<2	<2	<2	<5	1280.71

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
12/22/2005	GMW-3	<2	<2	<2	<5	1279.24
11/13/2006	GMW-3	<2	<2	<2	<5	1278.72
11/19/2007	GMW-3	<2	<2	<2	<5	1280.75
11/20/2008	GMW-3	<2	<2	<2	<5	1280.35
11/6/2009	GMW-3	<0.5	<1	<1	<4	1279.60
10/5/2010	GMW-3	<0.195	<0.196	<0.211	<0.407	1283.63
9/27/2011	GMW-3	<0.5	<1	<1	<3	1281.85
9/26/2012	GMW-3	4.66	<1	<1	351	1278.21
9/25/2013	GMW-3	<0.5	<1	<1	3.67	1277.66
10/29/2014	GMW-3	<0.5	<1	<1	<3	1278.35
12/2/2015	GMW-3 (PDB)	<0.5	<1	<1	<3	1279.08
12/19/2016	GMW-3 (bail)	<2	<2	<2	<6	1281.68
12/13/2017	GMW-3 (bail)	<2	<2	<2	<6	1281.01
2/28/1996	GMW-4	<2	<2	<2	<5	1281.07
9/30/1996	GMW-4	<2	<2	<2	<5	1280.41
3/26/1997	GMW-4	<2	<2	<2	<5	1282.44
6/17/1997	GMW-4	<2	<2	<2	<5	NA
8/28/1997	GMW-4	<2	<2	<2	<5	NA
11/12/1997	GMW-4	<2	<2	<2	<5	1279.88
3/20/1998	GMW-4	<2	<2	<2	<5	1280.25
6/17/1998	GMW-4	<2	<2	<2	<5	1282.21
9/17/1998	GMW-4	<2	<2	<2	<5	1278.25
12/15/1998	GMW-4	<2	<2	<2	<5	1281.55
3/26/1999	GMW-4	<2	<2	<2	<5	1281.37
6/23/1999	GMW-4	<2	<2	<2	<5	NA
3/29/2000	GMW-4	<2	<2	<2	<5	1278.55
6/29/2000	GMW-4	<2	<2	<2	<5	1278.36
9/21/2000	GMW-4	<2	<2	<2	<5	1277.51
1/3/2001	GMW-4	<2	<2	<2	<5	NA
5/13/2015	GMW-4 (PDB)	<0.5	<1	<1	<5	1277.37
12/2/2015	GMW-4 (PDB)	<0.5	<1	<1	<3	1278.01
12/19/2016	GMW-4 (bail)	<2	<2	<2	<6	1279.63
7/25/2017	GMW-4 (bail)	<2	<2	<2	<6	1279.27
12/13/2017	GMW-4 (bail)	<2	<2	<2	<6	1279.11
3/27/2001	GMW-6	<2	<2	<2	<5	1275.69

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
8/15/2003	GMW-6	<2	<2	<2	<5	1275.65
6/25/2004	GMW-6	<2	<2	<2	<5	1274.75
3/2/2011	GMW-6	<0.5	<1	<1	<3	1280.62
6/9/2011	GMW-6	<0.5	<1	<1	<3	1281.50
9/27/2011	GMW-6	<0.5	<1	<1	<3	1280.78
12/9/2011	GMW-6	<0.5	<1	<1	<3	1278.74
12/2/2015	GMW-6 (PDB)	<0.5	<1	<1	<3	1275.51
12/12/2017	GMW-6 (bail)	<2	<2	<2	<6	1278.53
7/17/2003	REPLACED					
7/24/2003	GMW-7R	12	16	**5470**	**15800**	1275.85
7/28/2003	GMW-7R	36	58	**7770**	**22400**	1275.94
8/1/2003	GMW-7R	<20	<20	**5130**	**14500**	1275.79
8/14/2003	GMW-7R	<20	<20	**3090**	8550	1275.36
8/29/2003	GMW-7R	<2	<2	210	550	1274.73
9/26/2003	GMW-7R	5	<5	**2480**	5660	1274.66
10/15/2003	GMW-7R	<2	3	**3330**	5940	NA
11/21/2003	GMW-7R	7	33	**4660**	9360	NA
12/2/2003	GMW-7R	<2	21	**4410**	1740	1274.03
1/13/2004	GMW-7R	<2	160	**4880**	9920	1274.95
2/4/2004	GMW-7R	5	84	**3440**	7210	NA
3/24/2004	GMW-7R	4	24	**2620**	6270	1275.38
4/30/2004	GMW-7R	<2	<2	**1280**	3400	1274.25
5/27/2004	GMW-7R	<2	<2	**1430**	3780	1273.89
6/23/2004	GMW-7R	<2	<2	**1770**	4230	1274.46
7/19/2004	GMW-7R	<2	<2	95	204	1274.13
9/27/2004	GMW-7R	<2	<2	<2	<5	1274.42
10/27/2004	GMW-7R	<2	<2	26	51	1274.39
12/14/2004	GMW-7R	<2	<2	314	1010	1274.31
1/18/2005	GMW-7R	<2	<2	500	1350	1275.74
2/28/2005	GMW-7R	<2	<2	**835**	2470	1275.99
3/16/2005	GMW-7R	<2	<2	439	1030	1276.02
4/7/2005	GMW-7R	62	460	690	1840	NA
5/24/2005	GMW-7R	<20	<20	**749**	2650	1276.69
6/20/2005	GMW-7R	<2	<2	**930**	2720	1277.03
8/12/2005	GMW-7R	<2	<2	**3720**	9060	1277.78
9/29/2005	GMW-7R	<2	<2	**3150**	7970	1277.43

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
10/24/2005	GMW-7R	<2	<2	**2270**	6190	1277.01
12/2/2005	GMW-7R	<2	<2	**1810**	5520	1276.33
12/22/2005	GMW-7R	<2	<2	**1770**	5340	NA
1/31/2006	GMW-7R	<2	<2	**2070**	6330	NA
2/22/2006	GMW-7R	<20	<20	**981**	3550	1275.87
3/20/2006	GMW-7R	<20	<20	**1230**	4030	1275.69
4/19/2006	GMW-7R	<20	<20	**1880**	6220	1275.98
5/16/2006	GMW-7R	<20	<20	**1220**	4050	1276.19
6/19/2006	GMW-7R	<20	<20	**2180**	7200	1276.08
7/17/2006	GMW-7R	<2	<2	**896**	3040	1276.13
8/21/2006	GMW-7R	<20	<20	**2100**	6970	1275.94
9/18/2006	GMW-7R	<20	<20	**2200**	7470	1275.74
10/16/2006	GMW-7R	<20	<20	**2420**	7400	1275.80
11/13/2006	GMW-7R	<20	<20	**2820**	8910	1275.68
12/14/2006	GMW-7R	<20	<20	**1350**	4480	1275.50
1/15/2007	GMW-7R	<20	<20	**1620**	5090	1275.50
2/15/2007	GMW-7R	2	<2	**1640**	5890	1275.62
3/6/2007	GMW-7R	<2	<2	**2310**	7270	1275.72
4/16/2007	GMW-7R	<2	<2	**2750**	7540	1276.15
5/16/2007	GMW-7R	<2	<2	**2940**	8570	1276.37
6/20/2007	GMW-7R	<2	<2	**2180**	6411	1276.60
7/16/2007	GMW-7R	<2	<2	**2070**	6090	1276.71
8/17/2007	GMW-7R	<2	<2	**1240**	4370	1276.06
9/17/2007	GMW-7R	<2	<2	**1360**	4850	1276.58
10/22/2007	GMW-7R	<2	<2	**1790**	6580	1276.81
11/19/2007	GMW-7R	4	<2	**2270**	7230	1277.43
12/14/2007	GMW-7R	4	<2	**2020**	6940	1277.38
1/17/2008	GMW-7R	3	<2	**1320**	4610	1277.52
2/22/2008	GMW-7R	3	<2	**2320**	7700	1277.30
3/24/2008	GMW-7R	4	<2	**2370**	7500	1277.45
4/22/2008	GMW-7R	5	<2	**2700**	8800	1277.28
5/14/2008	GMW-7R	3	<2	**1280**	4090	1277.39
6/23/2008	GMW-7R	3	2	**1800**	5720	1277.89
7/18/2008	GMW-7R	3	4	**938**	3300	1277.88
8/18/2008	GMW-7R	3	4	**1060**	3320	1278.14
9/30/2008	GMW-7R	<2	<2	642	2180	1277.67
10/27/2008	GMW-7R	3	<2	**1300**	4910	1277.27

GROUNDWATER ANALYTICAL DATA (ug/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
11/20/2008	GMW-7R	3	<2	**2070**	6290	1277.27
12/18/2008	GMW-7R	4	<2	**1980**	5830	1277.23
1/19/2009	GMW-7R	3	<2	**1460**	4670	1277.06
3/11/2009	GMW-7R	<25	<25	**2450**	8000	1276.68
6/25/2009	GMW-7R	4	<2	**2260**	6770	1276.60
9/17/2009	GMW-7R	5	<2	**2750**	9700	1277.44
11/6/2009	GMW-7R	4	<1	**3350**	**12400**	1277.75
3/18/2010	GMW-7R	2	<1.0	**2600**	**10100**	1278.32
6/17/2010	GMW-7R	<10	<20	**1570**	5420	1279.14
10/5/2010	GMW-7R	<19.5	<19.6	**2500**	8850	1282.20
12/7/2010	GMW-7R	<10	<20	**2480**	8150	1281.91
3/2/2011	GMW-7R	<10	<20	**2000**	6970	1280.62
6/9/2011	GMW-7R	<10	<20	**1100**	4160	1281.00
9/27/2011	GMW-7R	<10	<20	**3090**	**11600**	1280.46
12/9/2011	GMW-7R	<10	<20	**1850**	6670	1278.28
3/19/2012	GMW-7R	<5	<10	**1580**	6040	1277.11
9/26/2012	GMW-7R	<5	<10	**2370**	9070	1276.33
3/26/2013	GMW-7R	<5	<10	**2710**	9280	1274.53
6/26/2013	GMW-7R	2.77	<1	**2100**	7480	1274.52
7/24/2013	GMW-7R	**5.35**	<1	**4970**	**17300**	1275.08
8/28/2013	GMW-7R	**5.23**	<1	**5830**	**22000**	1274.94
9/25/2013	GMW-7R	<2.2	<3	**4690**	**15400**	1274.77
10/28/2013	GMW-7R	<5	<10	**4820**	**17200**	1274.45
11/18/2013	GMW-7R	**6.66**	<10	**4650**	**14300**	1274.29
12/27/2013	GMW-7R	<5	<10	**4150**	**13300**	1274.27
1/22/2014	GMW-7R	**5.0**	<10	**4820**	**16700**	1274.04
2/17/2014	GMW-7R	**8.3**	<3	**8780**	**16500**	1273.98
3/21/2014	GMW-7R	<5	<10	**5300**	**17500**	1273.86
4/21/2014	GMW-7R	**5.55**	<1	**4700**	**15600**	1273.75
5/22/2014	GMW-7R	**7**	<10	**5930**	**20300**	1273.74
6/20/2014	GMW-7R	**5**	<10	**6050**	**14700**	1273.89
7/17/2014	GMW-7R	**7**	<10	**4990**	**15000**	1274.34
8/20/2014	GMW-7R	**7**	<1	**4600**	**13800**	1274.54
10/29/2014	GMW-7R	**5.24**	<1	**3610**	**11100**	1274.49
11/25/2014	GMW-7R	**8.05**	<7.5	**5240**	**15400**	1274.70
3/26/2015	GMW-7R (PDB)	<0.5	<1	4.24	16.9	1274.87
5/13/2015	GMW-7R (PDB)	**6.49**	<1	**4550**	**13700**	1274.95

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	**WELL #**	**BENZENE**	**TOLUENE**	**E-BENZENE**	**XYLENES**	**Groundwater Elevation**
MCL		**5**	**1000**	**700**	**10000**	**(feet above sea level)**
10/12/2015	GMW-7R (PDB)	**5.11**	<10	**4180**	**12200**	1274.94
10/12/2015	GMW-7R (bail)	**5.5**	<10	**3150**	9330	1274.94
12/3/2015	GMW7R-P1	**2.01**	<1	**933**	3520	1274.98
12/3/2015	GMW7R-P2	**<5**	<10	**2960**	8230	"
12/3/2015	GMW7R-P3	**<5**	<10	**875**	1900	"
12/3/2015	GMW7R-P4	<0.5	<1	48.7	38.1	"
12/3/2015	GMW7R-P5	<0.5	<1	1.07	<3	"
12/3/2015	GMW7R-P6	<0.5	<1	<1	<3	"
12/3/2015	GMW7R (bail)	**<5**	<10	**3030**	9010	1274.98
5/24/2016	GMW7R (PDB)	<0.5	<1	<1	<3	1278.13
6/8/2016	GMW7R (bail)	3.32	<1.5	**2630**	9390	1278.81
7/14/2016	GMW7R (bail)	3.06	<1	**2410**	8280	1279.34
12/19/2016	GMW7R (bail)	4.69	<2	**3340**	**11400**	1278.65
6/8/2017	GMW7R (PDB)	<2	<2	10.9	6.21	1279.27
6/8/2017	GMW7R (bail)	2.37	<2	**1480**	4120	1279.27
7/25/2017	GMW7R (bail)	4.45	<0.187	**998**	2700	1279.43
12/12/2017	GMW7R (bail)	<2	<2	**1570**	4130	1278.09
12/19/2017	GMW7R (LF)	<20	<20	**2060**	5330	1277.90
3/24/2004	GMW-8	<2	<2	<2	<5	1277.26
6/25/2004	GMW-8	<2	<2	<2	<5	NA
9/27/2004	GMW-8	<2	<2	<2	<5	1275.49
12/14/2004	GMW-8	<2	<2	<2	<5	1275.63
3/16/2005	GMW-8	<2	<2	<2	<5	1277.66
6/20/2005	GMW-8	<2	<2	<2	<5	1278.92
12/22/2005	GMW-8	<2	<2	<2	<5	1277.76
11/13/2006	GMW-8	<2	<2	<2	<5	1277.03
11/19/2007	GMW-8	<2	<2	<2	<5	1279.12
11/20/2008	GMW-8	<2	<2	<2	<5	1278.68
11/6/2009	GMW-8	<0.5	<1	<1	<4	1279.55
10/5/2010	GMW-8	<0.195	<0.196	<0.211	<0.407	1283.23
9/27/2011	GMW-8	<0.5	<1	<1	<3	1281.22
9/26/2012	GMW-8	<0.5	<1	<1	<3	1276.85
9/25/2013	GMW-8	<0.5	<1	<1	<3	1276.10
10/29/2014	GMW-8	<0.5	<1	<1	<3	1276.29
12/2/2015	GMW-8 (PDB)	<0.5	<1	<1	<3	1276.69
12/19/2016	GMW-8 (bail)	<2	<2	<2	<6	1280.25

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
12/13/2017	GMW-8 (bail)	<2	<2	<2	<6	1279.48
3/29/2002	GMW-9R	<20	14300	23400	80400	1277.60
6/27/2002	GMW-9R	<20	4710	12500	48900	1276.41
9/26/2002	GMW-9R	84	8670	13100	50500	NA
12/11/2002	GMW-9R	48	32200	33440	115000	NA
3/26/2003	GMW-9R	<20	7400	16100	53600	1276.23
6/12/2003	GMW-9R	<20	5610	12700	44700	1277.42
8/15/2003	GMW-9R	5	3100	3200	24700	1276.37
12/2/2003	GMW-9R	<20	4540	10900	24100	1276.40
3/24/2004	GMW-9R	11	3750	10100	23100	NA
6/25/2004	GMW-9R	<20	7420	15200	54300	1273.03
9/27/2004	GMW-9R	<20	7850	2300	76500	1275.85
12/14/2004	GMW-9R	<20	9970	15500	55700	1275.73
3/16/2005	GMW-9R	<20	3530	8310	29300	1277.74
6/20/2005	GMW-9R	<20	4250	8790	32000	1279.08
12/22/2005	GMW-9R	<20	5390	17000	55100	1277.80
3/20/2006	GMW-9R	<20	1110	4380	14800	1277.25
6/19/2006	GMW-9R	<20	3670	13600	42800	1277.86
9/18/2006	GMW-9R	<20	2720	7900	23300	1277.08
11/13/2006	GMW-9R	<20	2980	7880	24100	1277.11
3/6/2007	GMW-9R	<20	2910	6250	19300	1277.57
6/20/2007	GMW-9R	<20	1930	4210	12100	1278.46
11/19/2007	GMW-9R	<20	1740	5750	18300	1279.12
3/24/2008	GMW-9R	21	1810	6620	23200	1279.39
6/23/2008	GMW-9R	6	1110	4640	9230	1279.47
8/7/2008	GMW-9R	<20	340	1430	4630	1279.30
8/27/2008	GMW-9R	53	245	1600	5220	1278.78
9/19/2008	GMW-9R	<2	8	407	1410	1278.50
10/27/2008	GMW-9R	7	1180	3550	12800	1278.85
11/20/2008	GMW-9R	11	2370	8720	27400	1278.86
3/11/2009	GMW-9R	<25	6960	17400	66400	1278.44
5/12/2009	GMW-9R	12	2780	9660	34700	NA
6/25/2009	GMW-9R	6	1280	5200	16200	NA
9/17/2009	GMW-9R	16	4150	12200	43600	1278.73
11/6/2009	GMW-9R	10	2300	11900	45600	1279.76
3/18/2010	GMW-9R	13	4270	8910	35600	1281.20

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
6/17/2010	GMW-9R	<50	3020	11600	40400	1280.79
10/5/2010	GMW-9R	<19.5	1400	9650	33200	1283.19
12/7/2010	GMW-9R	7	574	4850	18300	1282.81
3/2/2011	GMW-9R	<50	3830	13200	50400	1281.47
6/9/2011	GMW-9R	<50	2350	9240	32500	1282.46
9/27/2011	GMW-9R	60	2630	14700	58400	1281.21
12/9/2011	GMW-9R	<50	3580	17900	66800	1279.18
3/19/2012	GMW-9R	<50	2870	10400	41700	1278.27
9/26/2012	GMW-9R	<50	3430	17900	69900	1276.72
3/26/2013	GMW-9R	15.3	3610	19000	67600	1275.57
7/24/2013	GMW-9R	<5.5	1680	8740	31200	1276.66
9/25/2013	GMW-9R	<50	1950	12000	42500	1275.91
4/21/2014	GMW-9R	<5	72.7	748	2700	1274.71
8/20/2014	GMW-9R	<50	1740	7550	25200	1276.18
10/29/2014	GMW-9R	<5	1570	6230	15900	1276.00
3/26/2015	GMW-9R (PDB)	<5	81.6	1320	2870	1276.30
5/13/2015	GMW-9R (PDB)	<0.5	13.4	115	154	1276.40
10/12/2015	GMW-9R (PDB)	<5	1080	1920	5160	1276.31
10/12/2015	GMW-9R (bail)	<5	1830	4910	17200	1276.31
12/3/2015	GMW9R-P1	<0.5	<1	16.7	118	1276.62
12/3/2015	GMW9R-P2	<0.5	14.7	149	752	"
12/3/2015	GMW9R-P3	<0.5	11.3	188	965	"
12/3/2015	GMW9R (bail)	<5	1400	3920	14900	1276.62
3/7/2016	GMW9R-P1	<0.5	<1	<1	<3	1278.75
3/7/2016	GMW9R-P2	<0.5	<1	<1	<3	1278.75
5/24/2016	GMW9R (PDB)	<0.5	<1	<1	<3	1280.69
7/14/2016	GMW9R (bail)	5.32	1310	9310	29600	1280.46
12/19/2016	GMW9R (bail)	5.28	1530	8180	24600	1280.09
6/8/2017	GMW9R (bail)	4.23	1300	5830	21000	1280.83
7/25/2017	GMW9R (bail)	8.47	2720	12900	54800	1280.37
12/13/2017	GMW9R (bail)	8.03	1710	14200	49000	1279.34
9/30/1996	GMW-10	97	8260	17900	45900	1276.44
3/26/1997	GMW-10	<24	480	14100	18900	1281.07
6/17/1997	GMW-10	79	8230	28900	129000	NA
8/28/1997	GMW-10	43	5600	13000	371000	NA
11/12/1997	GMW-10	15	1480	6380	25100	1276.77

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	**WELL #**	**BENZENE**	**TOLUENE**	**E-BENZENE**	**XYLENES**	**Groundwater Elevation**
MCL		**5**	**1000**	**700**	**10000**	**(feet above sea level)**
3/20/1998	GMW-10	<2	<2	<2	<5	1278.76
3/20/1998	GMW-10	<2	8	520	1220	1278.76
6/19/1998	GMW-10	17	**1800**	**4510**	**19500**	1281.69
9/17/1998	GMW-10	49	**1930**	**5950**	**27300**	1278.10
12/15/1998	GMW-10	31	**2200**	**7070**	**37800**	1280.75
3/26/1999	GMW-10	26	**2010**	**5320**	**23600**	1281.06
6/23/1999	GMW-10	<2	28	190	540	NA
9/29/1999	GMW-10	<2	<2	2	12	1279.44
3/29/2000	GMW-10	<5	6	210	320	1278.74
6/29/2000	GMW-10	<2	<2	53	39	1278.44
7/21/2000	GMW-10	2	250	540	2570	NA
12/1/2000	**REMOVED**					
9/25/2001	**REPLACED**					
3/29/2002	GMW-10R	<20	230	**7940**	**29900**	1275.85
6/27/2002	GMW-10R	<20	565	**7030**	**29900**	1276.73
9/26/2002	GMW-10R	7	630	**8720**	**30100**	NA
12/11/2002	GMW-10R	<2	336	**10520**	**42600**	NA
6/15/2003	GMW-10R	<20	460	**4780**	**20000**	NA
8/7/2008	GMW-10R	<2	10	85	346	1276.71
8/27/2008	GMW-10R	<20	<20	201	644	1278.78
10/27/2008	GMW-10R	3	191	**3630**	14500	1279.02
5/12/2009	GMW-10R	11	890	**6940**	**23500**	NA
7/8/2009	GMW-10R	10	378	**6440**	**20900**	1278.85
9/17/2009	GMW-10R	3	72	875	3060	1278.60
3/26/2015	GMW-10R(PDB)	<0.5	<1	<1	6.99	1276.69
5/13/2015	GMW-10R(PDB)	<0.5	<1	<1	<3	1276.81
10/12/2015	GMW-10R(PDB)	<0.5	<1	1.49	15	1276.68
12/3/2015	GMW10R-P1	<0.5	<1	1.32	13.3	1277.10
12/3/2015	GMW10R-P2	<0.5	<1	168	844	"
12/3/2015	GMW10R-P3	<0.5	<1	1.33	5.17	"
12/3/2015	GMW10R (bail)	**10.3**	44	**5920**	**20800**	1277.10
3/7/2016	GMW10R-P1	<0.5	<1	<1	<3	1279.25
3/7/2016	GMW10R-P2	<0.5	<1	<1	<3	1279.25
5/24/2016	GMW10R (PDB)	<0.5	<1	<1	<3	1281.34
12/19/2016	GMW10R (bail)	<2	<2	**2040**	7180	1280.53
6/8/2017	GMW10R (bail)	4.1	108	**3120**	**10600**	1281.29
12/13/2017	GMW10R (bail)	**8.89**	319	**6910**	**25900**	1279.70

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
3/7/2016	GMW11 (PDB)	<0.5	<1	<1	<3	1278.16
3/2/2017	GMW11 (bail)	<2	6.12	1440	5640	1279.21
9/29/2001	INSTALLED					
3/29/2002	GMW-13	115	4220	24900	93200	1278.65
6/27/2002	GMW-13	<20	4700	16900	63600	1278.43
9/26/2002	GMW-13	14	6800	22800	78800	NA
12/11/2002	GMW-13	16	11600	25300	96000	NA
3/26/2003	GMW-13	<20	10100	24600	73500	1276.94
6/12/2003	GMW-13	<20	6150	23100	90400	1278.41
8/15/2003	GMW-13	10	5410	17300	69400	1278.43
12/2/2003	GMW-13	<20	10500	23500	87200	1277.35
3/24/2004	GMW-13	<20	4760	15500	77100	1278.58
6/25/2004	GMW-13	<20	6650	24400	100000	1278.75
9/27/2004	GMW-13	<20	13200	37800	135000	1278.89
12/14/2004	GMW-13	<20	4660	16000	73500	1278.11
3/16/2005	GMW-13	<20	5280	18400	75900	1278.64
6/20/2005	GMW-13	<20	6930	20000	78400	1280.04
12/22/2005	GMW-13	<20	6970	20400	88200	1278.35
11/13/2006	GMW-13	<20	8370	20700	87600	1277.99
11/19/2007	GMW-13	<20	4350	10300	55800	1280.01
11/20/2008	GMW-13	<20	6160	13400	60400	1279.67
6/25/2009	GMW-13	6	9180	16300	68300	NA
11/6/2009	GMW-13	<50	8330	19900	112000	1280.46
10/5/2010	GMW-13	<19.5	11200	25100	109000	1283.26
9/27/2011	GMW-13	<50	5430	16900	77400	1281.47
9/26/2012	GMW-13	<50	12900	24700	105000	1277.64
7/24/2013	GMW-13	<11	12700	25800	116000	1283.09
9/25/2013	GMW-13	<50	15100	27900	110000	1276.97
8/20/2014	GMW-13	<100	11200	23800	108000	1277.64
10/29/2014	GMW-13	1.64	10300	20000	90900	1277.46
5/13/2015	GMW-13 (PDB)	3.85	8970	17900	97800	1277.79
10/12/2015	GMW-13 (PDB)	<5	8650	28400	139000	1277.59
10/12/2015	GMW-13 (bail)	<5	23900	52500	105000	1277.59
12/3/2015	GMW13-P1	<5	9910	19800	104000	1278.21
12/3/2015	GMW13-P2	<5	9510	18700	96000	"

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	**WELL #**	**BENZENE**	**TOLUENE**	**E-BENZENE**	**XYLENES**	**Groundwater Elevation**
MCL		**5**	**1000**	**700**	**10000**	**(feet above sea level)**
12/3/2015	GMW13 (bail)	<5	**9380**	**18200**	**99300**	1278.21
3/7/2016	GMW13-P1	<110	**7750**	**16000**	**84600**	1280.33
3/7/2016	GMW13-P2	<110	**8430**	**14200**	**70900**	1280.33
7/14/2016	GMW13 (bail)	**5**	**9330**	**18100**	**92100**	1281.28
12/19/2016	GMW-13 (bail)	**21.8**	**7070**	**16100**	**94500**	1281.01
7/25/2017	GMW-13 (bail)	**14.6**	**8540**	**18000**	**86300**	1280.84
12/13/2017	GMW-13 (bail)	**6.55**	**8970**	**20200**	**93600**	1280.29
10/4/2001	GMW-14	**150**	**28400**	**33700**	**99600**	1276.88
12/14/2001	GMW-14	**144**	**26700**	**24600**	**81000**	1277.98
3/29/2002	GMW-14	**93**	**28000**	**26400**	**84100**	1278.26
6/27/2002	GMW-14	**23**	**22500**	**21000**	**66100**	1277.48
9/26/2002	GMW-14	**48**	**25100**	**18600**	**65000**	NA
12/11/2002	GMW-14	**64**	**30500**	**26000**	**101000**	NA
3/26/2003	GMW-14	**59**	**27900**	**27800**	**75400**	1276.67
6/12/2003	GMW-14	**<20**	**26000**	**24200**	**75100**	1278.02
8/15/2003	GMW-14	**53**	**20600**	**19100**	**64200**	1277.61
12/2/2015	GMW-14 (PDB)	**61.9**	**41900**	**32800**	**166000**	1277.76
12/19/2016	GMW-14 (bail)	**79.8**	**23900**	**23600**	**121000**	1280.83
1/18/2018	GMW-14 (LF)	**60.5**	**16600**	**13100**	**61800**	1279.83
7/18/2003	GMW-15	2	30	**1350**	1690	NA
7/28/2003	GMW-15	<20	48	**2190**	3250	1276.39
8/1/2003	GMW-15	<20	<20	**5130**	**14500**	1276.04
8/14/2003	GMW-15	<2	50	566	1400	1275.47
9/29/2003	GMW-15	<2	<2	640	1980	1274.62
12/2/2003	GMW-15	<2	11	**1970**	4580	1275.98
1/13/2004	GMW-15	<2	24	**2340**	4440	1275.34
3/24/2004	GMW-15	3	20	**2020**	4800	1275.85
6/25/2004	GMW-15	<2	<2	294	673	1274.58
9/27/2004	GMW-15	<2	<2	<2	6	1274.55
12/14/2004	GMW-15	<2	<2	<2	<5	1274.34
1/18/2005	GMW-15	<2	<2	2	20	1276.22
2/28/2005	GMW-15	<2	<2	<2	7	1276.39
3/16/2005	GMW-15	<2	<2	<2	7	1276.42
4/7/2005	GMW-15	<2	<2	8	19	1276.45
5/24/2005	GMW-15	<2	<2	79	243	1277.20

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
6/20/2005	GMW-15	<2	<2	913	2360	1277.50
8/12/2005	GMW-15	<2	<2	2860	6470	1278.13
9/29/2005	GMW-15	<2	<2	4880	7630	1277.63
10/24/2005	GMW-15	<2	<2	2790	5260	1277.30
12/2/2005	GMW-15	<2	<2	3040	8230	1276.76
12/22/2005	GMW-15	<2	61	2550	5920	1276.71
1/31/2006	GMW-15	<2	61	2880	7430	1276.45
2/22/2006	GMW-15	<20	<20	2530	5664	1276.18
3/20/2006	GMW-15	<20	<20	2610	6140	1276.04
4/19/2006	GMW-15	<20	<20	2170	4070	1276.42
5/16/2006	GMW-15	<5	4	1370	2300	1276.62
6/19/2006	GMW-15	7	<2	3800	6200	1276.49
7/17/2006	GMW-15	6	<2	2020	3760	1276.39
8/21/2006	GMW-15	<20	<20	4400	10100	1276.21
9/18/2006	GMW-15	<20	<20	4870	11000	1276.02
10/16/2006	GMW-15	<20	<20	5630	12400	1276.13
11/13/2006	GMW-15	<20	<20	6010	13100	1275.89
12/14/2006	GMW-15	<20	<20	3350	9090	1275.80
1/15/2007	GMW-15	<20	<20	4590	9540	1275.85
2/15/2007	GMW-15	5	<2	3550	7360	1275.99
3/6/2007	GMW-15	<20	<20	3080	6500	1276.13
4/16/2007	GMW-15	<20	<20	1870	3380	1276.48
5/16/2007	GMW-15	<20	<20	1900	3790	1276.81
6/20/2007	GMW-15	<20	<20	4320	7640	1277.05
7/16/2007	GMW-15	<20	<20	4380	10400	1277.08
8/17/2007	GMW-15	<20	<20	4330	7550	1276.69
9/17/2007	GMW-15	<20	<20	3510	7770	1276.82
10/22/2007	GMW-15	<20	<20	1140	2660	1277.23
11/19/2007	GMW-15	<2	<2	2610	5500	1277.80
12/14/2007	GMW-15	<20	<20	4020	9720	1277.68
1/17/2008	GMW-15	<20	25	5120	13800	1277.84
2/22/2008	GMW-15	<20	<20	3480	9060	1277.60
3/24/2008	GMW-15	<20	<20	1910	5750	1276.90
4/22/2008	GMW-15	<20	<20	1770	5680	1277.60
5/14/2008	GMW-15	<20	<20	1440	6460	1277.78
6/23/2008	GMW-15	<20	<20	2190	9870	1278.23
7/18/2008	GMW-15	<20	<20	1600	5840	1278.09

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
8/18/2008	GMW-15	<20	<20	**985**	4770	1278.36
9/19/2008	GMW-15	<20	<20	**1450**	5880	1277.80
10/27/2008	GMW-15	<20	<20	491	1560	1277.55
11/20/2008	GMW-15	7	<2	699	2000	1277.59
12/18/2008	GMW-15	<20	<20	**1150**	3840	1277.59
1/19/2009	GMW-15	<20	<20	**1780**	6050	1277.41
3/11/2009	GMW-15	<25	<25	**1550**	**10650**	1277.06
6/25/2009	GMW-15	**5**	2	**1540**	6210	1276.82
9/17/2009	GMW-15	**9**	<20	**1360**	7540	1277.82
11/6/2009	GMW-15	**8**	<1	**1280**	7570	1278.17
11/6/2009	GMW-15	<100	<100	380	2400	1278.17
3/18/2010	GMW-15	2	5	**701**	3150	1278.89
6/17/2010	GMW-15	**6**	<10	**1650**	6410	1279.57
10/5/2010	GMW-15	**8**	2	**2640**	**13600**	1282.38
12/7/2010	GMW-15	**6**	<10	**1090**	8870	1282.12
3/2/2011	GMW-15	**6**	<10	**1190**	4890	1280.48
6/9/2011	GMW-15	**9**	<10	**3860**	**16300**	1281.43
9/27/2011	GMW-15	**11.1**	<10	**6890**	**25800**	1280.66
12/9/2011	GMW-15	**14**	<10	**10200**	**32600**	1278.50
3/19/2012	GMW-15	<50	<100	**6940**	**24700**	1277.40
9/26/2012	GMW-15	<10	<20	**6570**	**23000**	1275.99
3/26/2013	GMW-15	1.48	<15	284	983	1274.76
5/3/2013	GMW-15	3.0	<25	**2060**	6680	1274.80
6/26/2013	GMW-15	4.72	1.60	**2820**	**10900**	1275.46
7/24/2013	GMW-15	4.01	<1	156	107	1278.72
9/25/2013	GMW-15	<5.50	<7.50	**2820**	**12400**	1275.04
10/28/2013	GMW-15	**6.39**	<10	**2770**	**10100**	1274.77
4/21/2014	GMW-15	**12.1**	2.47	**5720**	**20400**	1273.92
10/29/2014	GMW-15	4.15	9.21	**1200**	6240	1274.99
3/26/2015	GMW-15 (PDB)	**5.39**	<10	368	2710	1275.19
5/13/2015	GMW-15 (PDB)	**8.06**	1.35	**2030**	9990	1275.29
10/12/2015	GMW-15 (PDB)	2.13	<1	370	495	1275.24
12/3/2015	GMW15-P1	<5	<10	537	1040	1275.36
12/3/2015	GMW15-P2	<5	<10	395	777	"
12/3/2015	GMW15-P3	<5	<10	363	732	"
12/3/2015	GMW15 (bail)	<5	<10	540	4310	1275.36
3/7/2016	GMW15-P1	<0.5	<1	38.7	290	1276.96

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
3/14/2016	GMW15-P3	<0.5	<1	2.21	124	1277.00
3/14/2016	GMW15-P4	<0.5	<1	2.13	42.40	"
3/14/2016	GMW15-P5	<0.5	<1	1.55	30.1	"
3/14/2016	GMW15-P6	<0.5	<1	<1	14.5	1277.00
5/24/2016	GMW-15 (PDB)	3.56	16.2	615	2990	1278.63
12/19/2016	GMW-15 (bail)	2.23	<2	**992**	4990	1279.00
6/8/2017	GMW-15 (bail)	2.57	2.37	**1080**	4040	1279.64
7/25/2017	GMW-15 (bail)	4.86	<0.187	**1280**	4320	1279.73
12/12/2017	GMW-15 (bail)	<2	<2	**1330**	5460	1278.48
7/18/2003	GMW-16	6	1110	**5400**	**12700**	1276.79
7/28/2003	GMW-16	<20	155	**2600**	8360	1276.58
8/1/2003	GMW-16	<20	322	**3670**	**12600**	1276.22
8/14/2003	GMW-16	2	25	334	883	1275.67
9/29/2003	GMW-16	<2	56	189	715	1274.90
12/2/2003	GMW-16	<2	<2	159	470	1275.56
1/13/2004	GMW-16	<2	<2	142	324	1275.52
3/24/2004	GMW-16	<2	<2	635	2220	1276.06
6/25/2004	GMW-16	<2	<2	113	399	1274.90
9/27/2004	GMW-16	<2	5	159	397	1274.86
12/14/2004	GMW-16	<2	<5	75	227	1274.65
3/16/2005	GMW-16	<2	<5	73	155	1276.63
6/20/2005	GMW-16	<2	<5	316	902	1277.73
12/22/2005	GMW-16	<2	10	**2450**	8260	1276.92
11/13/2006	GMW-16	<2	27	**3720**	**11100**	1276.11
11/19/2007	GMW-16	6	33	**2870**	8940	1278.02
11/20/2008	GMW-16	<20	<20	**1700**	4460	1277.75
11/6/2009	GMW-16	5	37	**5940**	**20200**	1278.40
10/5/2010	GMW-16	<19.5	<19.6	**4020**	**11500**	1282.53
9/27/2011	GMW-16	<5	19.3	**1080**	3060	1280.83
9/26/2012	GMW-16	<5	<10	507	1480	1276.12
9/25/2013	GMW-16	<5	111.0	**4310**	**13700**	1275.44
11/3/2014	GMW-16	<5	24.7	**4000**	**13000**	1275.88
12/2/2015	GMW-16 (PDB)	<0.5	<1	112	32	1275.56
3/7/2016	GMW16-P1	<0.5	<1	129	316	1277.19
3/7/2016	GMW16-P2	<0.5	<1	47	77.4	"
3/7/2016	GMW16-P3	<0.5	<1	60.2	166	1277.19

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	**WELL #**	**BENZENE**	**TOLUENE**	**E-BENZENE**	**XYLENES**	**Groundwater Elevation**
MCL		**5**	**1000**	**700**	**10000**	**(feet above sea level)**
12/19/2016	GMW-16 (bail)	2.67	35.6	**2980**	**10500**	1279.16
12/12/2017	GMW-16 (bail)	<2	31.5	**937**	2950	1278.66
7/28/2003	GMW-17	29	3310	**15400**	**58800**	1276.28
8/1/2003	GMW-17	<20	400	**1700**	7480	1276.02
8/14/2003	GMW-17	<20	206	**1140**	4480	1275.51
9/29/2003	GMW-17	<2	32	42	202	1274.79
12/2/2003	GMW-17	<2	<2	6	20	1275.30
3/24/2004	GMW-17	<2	<2	2	10	1275.75
6/25/2004	GMW-17	<2	<2	19	425	1274.72
9/27/2004	GMW-17	<2	123	274	1180	1274.70
12/14/2004	GMW-17	<2	<2	330	1320	1274.49
1/18/2005	GMW-17	<2	103	305	1550	1276.15
2/28/2005	GMW-17	<2	136	250	999	1276.27
3/16/2005	GMW-17	<2	155	261	996	1276.31
4/7/2005	GMW-17	<2	56	79	420	1275.77
5/24/2005	GMW-17	<2	<2	47	519	1277.09
6/20/2005	GMW-17	<2	<2	40	128	1276.91
12/22/2005	GMW-17	<2	<2	109	535	1276.63
3/20/2006	GMW-17	<2	<2	<5	<5	NA
6/19/2006	GMW-17	<2	<2	5	6	1276.53
9/18/2006	GMW-17	<2	<2	8	21	1275.93
11/13/2006	GMW-17	<2	<2	<2	15	1275.83
3/6/2007	GMW-17	<2	<2	<2	<5	1276.03
6/20/2007	GMW-17	<2	<2	800	361	1276.90
11/19/2007	GMW-17	<2	<2	9	10	1275.55
3/24/2008	GMW-17	<2	<2	14	23	1277.80
6/23/2008	GMW-17	<2	<2	133	230	1278.12
09-19-08	GMW-17	<2	<2	<2	<5	1277.81
11/20/2008	GMW-17	<2	<2	<2	<5	1277.46
3/11/2009	GMW-17	<1	<1	2	6	1276.95
6/25/2009	GMW-17	<2	<2	<2	4	1276.73
9/17/2009	GMW-17	5	23	70	325	1277.73
11/6/2009	GMW-17	<0.5	<1	2	6	1278.09
3/18/2010	GMW-17	<0.5	<1	<1	<3	1278.80
6/17/2010	GMW-17	<0.5	<1	20	32	1279.51
10/5/2010	GMW-17	<0.195	<0.196	32	57	1282.31

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
12/7/2010	GMW-17	<0.5	<1.0	<1.0	<3.0	1282.08
3/2/2011	GMW-17	<0.5	<1.0	122	327	1280.41
6/9/2011	GMW-17	<0.5	<1.0	<1.0	<3	1281.36
9/27/2011	GMW-17	<0.5	<1	5.36	17	1280.61
12/9/2011	GMW-17	<0.5	<1	4.68	11	1278.46
3/19/2012	GMW-17	<0.5	<1	<1	<3	1277.35
9/26/2012	GMW-17	<0.5	<1	<1	<3	1275.87
3/26/2013	GMW-17	<0.5	<1	<1	<3	1274.72
9/25/2013	GMW-17	<0.5	<1	<1	<3	1275.00
4/21/2014	GMW-17	<0.5	2.75	13.3	75.6	1273.92
10/29/2014	GMW-17	<0.5	<1	2.0	22.6	1274.91
12/2/2015	GMW-17 (PDB)	1.05	<1	489	722	1275.25
12/19/2016	GMW-17 (bail)	<2	<2	120	420	1278.93
12/12/2017	GMW-17 (bail)	<2	<2	10.7	23.9	1278.44
8/15/2003	GMW-18	<2	21	109	341	1275.46
9/29/2003	GMW-18	<2	<2	120	229	1274.92
12/2/2003	GMW-18	<2	14	188	522	1275.39
3/24/2004	GMW-18	<2	9	150	367	1275.87
6/25/2004	GMW-18	<2	23	220	594	1274.88
9/27/2004	GMW-18	<2	5	104	243	1274.87
12/14/2004	GMW-18	<2	<2	60	174	1274.65
3/16/2005	GMW-18	<2	48	393	847	1276.41
6/20/2005	GMW-18	<2	6	100	313	1277.51
12/22/2005	GMW-18	<2	31	574	1380	1276.70
11/13/2006	GMW-18	<2	21	474	1030	1275.86
11/19/2007	GMW-18	<2	<2	8	27	1278.03
11/20/2008	GMW-18	<2	47	210	677	1277.54
11/6/2009	GMW-18	<0.500	36	195	565	1278.13
10/5/2010	GMW-18	WELL SEAL FAILED				
1/26/2011	GMW-18R	WELL REPLACE WITH GMW-18R				
2/4/2011	GMW-18R	<0.5	64.10	241	737	
9/27/2011	GMW-18R	<0.5	<1	6.85	35.8	1280.32
9/26/2012	GMW-18R	<0.5	<1	49.2	172	1275.64
9/25/2013	GMW-18R	<0.5	<1	104	284	1274.68
11/3/2014	GMW-18R	<0.5	<1	38.6	138	1274.72
12/2/2015	GMW18R (PDB)	<0.5	<1	<1	<3	1275.24

GROUNDWATER ANALYTICAL DATA (ug/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
12/19/2016	GMW-18R (bail)	<2	<2	4.42	6.5	1278.95
12/12/2017	GMW-18R (bail)	<2	<2	5.76	14.7	1278.45
8/15/2003	GMW-19	<2	<2	8	21	1274.87
9/29/2003	GMW-19	<2	<2	<2	<5	1274.26
10/15/2003	GMW-19	<2	<2	<2	<5	1274.35
11/21/2003	GMW-19	<2	<2	<2	<5	1274.48
12/2/2003	GMW-19	<2	<2	<2	<5	1274.69
1/13/2004	GMW-19	<2	<2	<2	<5	1274.51
2/4/2004	GMW-19	<2	<2	<2	<5	1274.72
3/24/2004	GMW-19	<2	<2	104	120	1274.93
4/30/2004	GMW-19	<2	<2	<2	7	1273.88
5/27/2004	GMW-19	<2	<2	<2	<5	1273.45
6/23/2004	GMW-19	<2	<2	240	397	1274.03
7/19/2004	GMW-19	<2	<2	121	140	1273.70
9/27/2004	GMW-19	<2	<2	3	13	1273.98
10/27/2004	GMW-19	<2	<2	13	143	1273.97
12/14/2004	GMW-19	<2	<2	8	48	1274.02
3/16/2005	GMW-19	<2	<2	637	1050	1275.77
12/22/2005	GMW-19	<2	<2	21	73	1276.05
3/20/2006	GMW-19	<2	<2	<2	<2	1275.42
6/19/2006	GMW-19	<2	<2	11	71	1275.82
9/18/2006	GMW-19	<2	<2	<2	<2	1275.48
11/13/2006	GMW-19	<2	<2	<2	<2	1275.42
3/6/2007	GMW-19	<2	<2	<2	6	1275.44
6/20/2007	GMW-19	<2	<2	408	1610	1276.35
11/19/2007	GMW-19	<2	<2	376	1850	1277.16
3/24/2008	GMW-19	<2	<2	4	704	1277.15
6/23/2008	GMW-19	2	<2	608	3040	1277.67
9/19/2008	GMW-19	<2	<2	207	702	1277.42
11/20/2008	GMW-19	<2	<2	97	732	1277.03
3/11/2009	GMW-19	<1	<1	17	536	1276.44
6/25/2009	GMW-19	<2	<2	<2	160	1276.24
9/17/2009	GMW-19	<2	<2	233	810	1277.18
11/6/2009	GMW-19	1	<1	42	1120	1277.49
3/18/2010	GMW-19	3	<1	572	4280	1277.99
6/17/2010	GMW-19	<5	<10	**984**	3900	1278.80

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
10/5/2010	GMW-19	<0.975	<0.980	403	1120	1282.01
12/7/2010	GMW-19	<2.5	<5	574	2320	1281.63
3/2/2011	GMW-19	<2.5	<5	92	362	1279.91
6/9/2011	GMW-19	<2.5	<5	286	844	1280.68
9/27/2011	GMW-19	<2.5	<5	137	477	1280.27
12/9/2011	GMW-19	1	<1	25	247	1278.05
3/19/2012	GMW-19	1	<1	158	680	1276.84
9/26/2012	GMW-19	1.53	<1	332	1820	1274.28
3/26/2013	GMW-19	<5	<10	<10	<30	1274.25
5/3/2013	GMW-19	<0.5	<1	<1	4.1	1274.75
6/26/2013	GMW-19	0.838	<1	61.8	366	1274.81
7/24/2013	GMW-19	1.29	<1	269	775	1274.48
9/25/2013	GMW-19	<0.5	<1	<1	61.5	1274.22
4/21/2014	GMW-19	<0.5	<1	<1	<3	1273.51
10/29/2014	GMW-19	1.56	<1	153	245	1274.39
3/26/2015	GMW-19 (PDB)	<0.5	<1	<1	4.76	1274.59
5/13/2015	GMW-19 (PDB)	<0.5	<1	<1	<3	1274.68
12/3/2015	GMW19 (PDB)	<0.5	<1	<1	<3	1274.73
12/3/2015	GMW19 (bail)	1.06	<1	<1	75.2	1274.73
5/24/2016	GMW19 (PDB)	<0.5	<1	13.5	46.7	1277.86
6/8/2016	GMW19 (bail)	3.39	<1	**1520**	6150	1278.56
12/19/2016	GMW-19 (bail)	<2	<2	<2	<6	1278.41
6/8/2017	GMW19 (PDB)	<2	<2	<2	<6	1279.02
6/8/2017	GMW19 (bail)	<2	<2	<2	<6	1279.02
12/12/2017	GMW19 (bail)	<2	<2	<2	<6	1277.84
12/19/2017	GMW19 (LF)	<2	<2	25.1	79.4	1277.67
8/15/2003	GMW-20	<20	<20	**1020**	2990	1275.28
9/29/2003	GMW-20	<2	<2	66	176	1274.66
10/15/2003	GMW-20	<2	<2	420	1530	1274.79
11/21/2003	GMW-20	<2	7	**1320**	4640	1275.03
12/2/2003	GMW-20	<2	<2	**743**	2520	1275.16
1/13/2004	GMW-20	<2	<2	560	2060	1274.94
2/4/2004	GMW-20	<2	<2	2	10	1275.26
3/24/2004	GMW-20	<2	<2	134	483	1275.43
4/30/2004	GMW-20	<2	<2	<2	<5	1274.26
5/27/2004	GMW-20	<2	<2	447	1280	1273.91

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
6/23/2004	GMW-20	<2	<2	18	41	1274.47
7/19/2004	GMW-20	<2	<2	250	794	1274.14
9/27/2004	GMW-20	<2	<2	11	30	1274.46
10/27/2004	GMW-20	<2	<2	<2	<5	1274.42
12/14/2004	GMW-20	<2	<2	29	94	1274.27
3/16/2005	GMW-20	<2	<2	32	117	1275.97
12/22/2005	GMW-20	<2	<2	94	319	1276.28
3/20/2006	GMW-20	<2	<2	239	643	1275.63
6/19/2006	GMW-20	<2	<2	8	17	1276.02
9/18/2006	GMW-20	<20	<20	352	861	1275.68
11/13/2006	GMW-20	<2	<2	493	1040	1275.57
3/6/2007	GMW-20	<2	<2	**896**	2290	1275.69
6/20/2007	GMW-20	<2	<2	398	900	1276.53
11/19/2007	GMW-20	<2	3	**820**	2460	1277.39
3/24/2008	GMW-20	<2	3	343	1050	1277.41
6/23/2008	GMW-20	<2	<2	124	336	1277.82
9/19/2008	GMW-20	<2	<2	109	287	1277.68
11/20/2008	GMW-20	<2	<2	324	801	1277.22
3/11/2009	GMW-20	<1	<1	280	960	1276.62
6/25/2009	GMW-20	<2	<2	220	628	1276.46
9/17/2009	GMW-20	<2	6	506	1480	1277.32
11/6/2009	GMW-20	2	1	**751**	2820	1277.79
3/18/2010	GMW-20	<0.5	<1	3	6	1278.30
6/17/2010	GMW-20	1	<1	398	1170	1279.13
10/5/2010	GMW-20	<0.195	<0.196	29	75	1282.07
12/7/2010	GMW-20	<0.5	<1	21	58	1282.81
3/2/2011	GMW-20	2	<1	**1050**	2950	1280.06
6/9/2011	GMW-20	<0.5	<1	6	14	1281.02
9/27/2011	GMW-20	<0.5	<1	63.3	184	1280.39
12/9/2011	GMW-20	1	<1	356	1160	1278.25
3/19/2012	GMW-20	<2.5	5	**1000**	3190	1277.07
9/26/2012	GMW-20	<5	<10	**1410**	4250	1275.63
3/26/2013	GMW-20	<5	<10	**4030**	**10200**	1274.49
5/3/2013	GMW-20	<5	<10	**1850**	4620	1274.48
6/26/2013	GMW-20	<2.5	<5	**963**	2710	1274.98
7/24/2013	GMW-20	1.09	<1	**752**	3920	1275.04
8/28/2013	GMW-20	1.19	<1	**876**	2730	1274.79

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
9/25/2013	GMW-20	<5	<10	**1300**	4290	1274.72
10/28/2013	GMW-20	<5	<10	**1060**	3430	1274.39
11/18/2013	GMW-20	1.16	<1	**782**	1910	1274.22
4/21/2014	GMW-20	<0.5	<1	**749**	2100	1273.69
10/29/2014	GMW-20	0.515	<1	383	842	1274.44
3/26/2015	GMW20 (PDB)	<0.5	<1	<1	<3	1274.82
5/13/2015	GMW20 (PDB)	<0.5	<1	<1	<3	1274.88
12/3/2015	GMW20 (PDB)	<0.5	<1	<1	<3	1274.94
12/3/2015	GMW20 (bail)	<5	<10	310	1040	1274.94
5/24/2016	GMW20 (PDB)	<0.5	<1	<1	<3	1278.25
6/8/2016	GMW20 (bail)	1.67	<1	**811**	2930	1278.76
12/19/2016	GMW20 (bail)	<2	<2	537	2160	1278.61
6/8/2017	GMW20 (bail)	<2	<2	573	1760	1279.24
12/12/2017	GMW20 (bail)	<2	<2	**1430**	4180	1278.10
4/5/2004	GMW-21	<2	<2	**4580**	**10800**	NA
4/7/2004	GMW-21	**8**	13	**5300**	**12200**	1275.07
4/30/2004	GMW-21	<2	<2	**1070**	2940	1274.21
5/27/2004	GMW-21	<2	<2	**2460**	6740	1273.86
6/23/2004	GMW-21	<2	<2	**2510**	6860	1274.33
7/19/2004	GMW-21	<2	<2	**2890**	9410	1274.10
9/27/2004	GMW-21	<2	15	**2870**	9610	1274.38
10/27/2004	GMW-21	<2	<20	**6760**	**27200**	1274.34
12/14/2004	GMW-21	<2	<20	**2380**	**12600**	1274.28
1/18/2005	GMW-21	<2	49	**3670**	**10100**	1275.44
2/28/2005	GMW-21	<20	<20	**2330**	7300	1275.64
3/16/2005	GMW-21	<20	<20	**2740**	8220	1275.68
4/7/2005	GMW-21	5	36	**2450**	6710	1275.74
5/24/2005	GMW-21	<2	24	**1890**	4900	1276.28
6/20/2005	GMW-21	<2	<20	**1020**	3310	1276.63
8/30/2005	GMW-21	<2	3	367	778	1277.21
9/29/2005	GMW-21	<2	<2	**1240**	2920	1276.99
10/24/2005	GMW-21	<2	<2	**1890**	6010	1276.73
12/2/2005	GMW-21	<2	<2	**1580**	4080	1276.16
12/22/2005	GMW-21	<2	211	**2880**	**12800**	1276.06
1/31/2006	GMW-21	<2	<2	**1680**	3990	1275.79
2/22/2006	GMW-21	<2	<2	**1230**	2710	1275.56

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
3/20/2006	GMW-21	<2	<2	1020	2190	1275.41
4/19/2006	GMW-21	<2	<2	1430	3130	1275.63
5/16/2006	GMW-21	<2	<2	1250	3010	1275.80
6/19/2006	GMW-21	4	<2	1902	4950	1275.76
7/17/2006	GMW-21	<30	<30	2590	6410	1275.78
8/21/2006	GMW-21	<20	<20	3590	8520	1275.65
9/18/2006	GMW-21	<20	<20	4330	10100	1275.48
10/16/2006	GMW-21	6	<2	4440	9330	1275.54
11/13/2006	GMW-21	<20	<20	4190	8890	1275.41
12/14/2006	GMW-21	<20	<20	3170	7020	1275.22
1/15/2007	GMW-21	<20	<20	3210	6930	1275.17
2/15/2007	GMW-21	5	<2	2570	6660	1275.30
3/6/2007	GMW-21	<20	<20	2960	7630	1275.34
4/16/2007	GMW-21	<20	<20	3820	8050	1275.77
5/16/2007	GMW-21	<20	<20	3270	7930	1275.98
6/20/2007	GMW-21	<20	<20	3670	9530	1276.26
7/16/2007	GMW-21	<20	<20	3800	10300	1276.42
8/17/2007	GMW-21	<20	<20	4020	12400	1276.18
9/17/2007	GMW-21	<20	<20	4190	12300	1276.36
10/22/2007	GMW-21	<20	<20	3800	13400	1276.48
11/19/2007	GMW-21	7	12	2670	7730	1276.99
12/14/2007	GMW-21	<20	<20	3110	9310	1277.07
1/17/2008	GMW-21	<20	<20	3450	10200	1277.28
2/22/2008	GMW-21	<20	<20	4040	11700	1277.07
3/24/2008	GMW-21	<20	<20	2430	7030	1277.21
4/22/2008	GMW-21	<20	<20	4240	12000	1277.01
5/14/2008	GMW-21	<20	<20	2500	6830	1277.07
6/23/2008	GMW-21	<20	<20	2580	6750	1277.60
8/18/2008	GMW-21	11	<2	3340	9240	1277.91
9/19/2008	GMW-21	<20	<20	2820	8500	1277.55
10/27/2008	GMW-21	<20	<20	3160	9150	1277.03
11/20/2008	GMW-21	<20	<20	4890	11800	1276.85
12/18/2008	GMW-21	3	<2	1440	3510	1276.94
1/19/2009	GMW-21	<20	<20	1830	5360	1276.77
3/11/2009	GMW-21	<25	<25	2800	6640	1276.36
6/25/2009	GMW-21	3	<2	1680	4880	1276.20
9/17/2009	GMW-21	7	<2	3100	8680	1277.16

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
11/6/2009	GMW-21	4	<1	3230	10100	1277.25
11/6/2009	GMW-21	<100	<100	2400	7300	1277.25
3/18/2010	GMW-21	3	<100	968	3600	1277.95
6/17/2010	GMW-21	<5	<10	443	1840	1278.88
10/5/2010	GMW-21	<3.90	<3.92	578	2300	1281.99
12/7/2010	GMW-21	<10.0	<20.0	1120	4470	1281.72
3/2/2011	GMW-21	<10.0	<20.0	617	2630	1279.96
6/9/2011	GMW-21	23	23	774	3040	1280.75
9/27/2011	GMW-21	<10	<20	411	1730	1280.28
12/9/2011	GMW-21	<5	<10	1030	3560	1278.08
3/19/2012	GMW-21	4	<5	1870	5100	1276.87
9/26/2012	GMW-21	5.8	<10	3630	10400	1275.53
3/26/2013	GMW-21	5.6	<10	4720	11500	1274.31
5/3/2013	GMW-21	7.3	<10	5180	14300	1274.29
6/26/2013	GMW-21	6.88	<10	4730	10600	1274.66
7/24/2013	GMW-21	<5	<10	1240	5500	1274.75
8/28/2013	GMW-21	4.89	<1	3170	12900	1274.64
9/25/2013	GMW-21	<5.5	<7.5	2990	9570	1274.46
10/28/2013	GMW-21	6.2	<7.5	2850	10500	1274.18
11/18/2013	GMW-21	5.5	<0.15	3790	12300	1274.08
12/27/2013	GMW-21	<10	<20	2300	9580	1274.05
1/22/2014	GMW-21	<5	<10	2780	11800	1273.86
2/17/2014	GMW-21	7.89	<3	4430	18500	1273.79
3/21/2014	GMW-21	<5	<10	2250	9540	1273.67
4/21/2014	GMW-21	4.91	<1	2790	11700	1273.57
5/22/2014	GMW-21	<0.5	<100	2300	9340	1273.54
6/20/2014	GMW-21	5.26	<10	2530	9650	1273.67
7/17/2014	GMW-21	8.43	<10	4110	12700	1274.03
8/20/2014	GMW-21	<5	<10	1200	4580	1274.18
10/29/2014	GMW-21	6.89	<100	3450	10400	1274.20
11/25/2014	GMW-21	6.98	<7.5	3280	9450	1274.39
3/26/2015	GMW-21 (PDB)	4.50	<1	1050	1640	1274.56
5/13/2015	GMW-21 (PDB)	11.7	<1	4150	8780	1274.65
10/12/2015	GMW-21 (PDB)	11.9	<1	7800	16100	1274.67
10/12/2015	GMW-21 (bail)	<5	<10	757	4520	1274.67
12/3/2015	GMW21-P1	10.7	<10	5470	12700	1274.67
12/3/2015	GMW21-P2	7.28	<10	2680	4530	"

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
12/3/2015	GMW21-P3	**6.82**	<10	**2430**	4310	"
12/3/2015	GMW21-P4	**6.31**	<10	**1790**	2800	"
12/3/2015	GMW21-P5	**3.44**	<1	**832**	867	"
12/3/2015	GMW21 (bail)	**7.26**	<10	**2920**	8400	1274.67
5/24/2016	GMW21 (PDB)	<0.5	<1	<1	<3	1277.72
6/8/2016	GMW21 (bail)	3.12	<1	**1160**	2770	1278.42
7/14/2016	GMW21 (bail)	3.55	<1	**1520**	5210	1279.15
12/19/2016	GMW21 (bail)	<2	<2	233	825	1278.39
4/13/2017	GMW21 (bail)	2.21	<2	**1170**	3520	1278.10
6/8/2017	GMW21 (PDB)	<2	<2	<2	<6	1278.97
6/8/2017	GMW21 (bail)	<2	<2	455	1450	1278.97
7/25/2017	GMW21 (bail)	3.92	<0.187	**984**	3010	1279.19
12/12/2017	GMW21 (bail)	2.25	<2	**1320**	4310	1277.89
12/19/2017	GMW21 (LF)	<20	<20	**1570**	4890	1277.65
4/5/2004	GMW-22	<2	<2	**3270**	6220	1275.06
4/7/2004	GMW-22	5	<2	**2230**	4710	1274.98
4/30/2004	GMW-22	<2	<2	<2	5	1274.18
5/27/2004	GMW-22	<2	<2	**1410**	2440	1273.80
6/23/2004	GMW-22	<2	<2	**3470**	5400	1274.25
7/19/2004	GMW-22	<2	<2	**2910**	3890	1274.03
9/27/2004	GMW-22	<20	<20	**2070**	3440	1274.30
10/27/2004	GMW-22	<20	<20	**2080**	3090	1274.26
12/14/2004	GMW-22	<2	<2	635	1200	1274.18
3/16/2005	GMW-22	<2	<2	641	1220	1275.57
11/20/2008	GMW-22	4	<2	151	2990	1276.79
12/2/2015	GMW-22 (PDB)	1.94	<1	82	2370	1274.59
3/7/2016	GMW22-P1	**10.5**	<10	**4310**	**13300**	1275.86
3/7/2016	GMW22-P2	1.54	<1	164	1190	"
3/7/2016	GMW22-P3	0.679	<1	4.28	55.1	1275.86
12/19/2016	GMW22 (bail)	**6.93**	<2	**2060**	9340	1278.29
4/13/2017	GMW22 (bail)	**5.86**	<2	**2080**	8860	1277.99
6/8/2017	GMW-22 (PDB)	**7.07**	<2	**1770**	7800	1278.86
6/8/2017	GMW22 (bail)	**5.41**	<2	**1420**	6580	1278.86
12/12/2017	GMW22 (bail)	2.70	<2	<20	2280	1277.77
4/5/2004	GMW-23	<2	<2	26	67	1274.77

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	**WELL #**	**BENZENE**	**TOLUENE**	**E-BENZENE**	**XYLENES**	**Groundwater Elevation**
MCL		**5**	**1000**	**700**	**10000**	**(feet above sea level)**
4/7/2004	GMW-23	<2	<2	<2	<5	1274.80
4/30/2004	GMW-23	<2	<2	<2	<5	1274.11
5/27/2004	GMW-23	<2	<2	<2	<5	1273.69
6/23/2004	GMW-23	<2	<2	<2	<5	1274.14
7/19/2004	GMW-23	<2	<2	<2	<5	1273.93
9/27/2004	GMW-23	<2	<2	6	38	1274.19
10/27/2004	GMW-23	<2	<2	<2	<5	1274.18
12/14/2004	GMW-23	<2	<2	3	40	1274.08
3/16/2005	GMW-23	<2	<2	<2	<5	1275.44
4/12/2006	GMW-23	<2	<2	<2	<5	1275.38
11/17/2004	SB-1	8	11	3790	9630	NA
11/17/2004	SB-2	<2	<2	<2	<5	NA
11/18/2004	SB-3	<2	<2	<2	<5	NA
11/18/2004	SB-4	<20	**7890**	**23800**	**96900**	NA
11/22/2004	GMW-24	<2	<2	<2	<5	1274.04
12/14/2004	GMW-24	<2	<2	<2	<5	1274.11
3/16/2005	GMW-24	<2	<2	<2	<5	1275.24
4/12/2006	GMW-24	<2	<2	<2	<5	1275.19
11/23/2004	GMW-25	<2	413	653	3680	1273.41
12/14/2004	GMW-25	<2	234	506	2030	1273.45
1/18/2005	GMW-25	<2	318	**744**	2860	1273.91
2/28/2005	GMW-25	<2	177	613	2060	1274.14
3/16/2005	GMW-25	<2	226	638	2260	1274.22
4/7/2005	GMW-25	<2	163	498	1760	1274.24
5/24/2005	GMW-25	<2	107	338	1030	1274.63
6/20/2005	GMW-25	<2	59	191	648	1274.98
8/30/2005	GMW-25	<2	<2	88	189	1275.79
9/29/2005	GMW-25	<2	<2	57	123	1275.61
10/24/2005	GMW-25	<2	<2	68	141	1275.34
12/2/2005	GMW-25	<2	<2	22	<5	1274.86
12/22/2005	GMW-25	<2	<2	50	29	1274.67

GROUNDWATER ANALYTICAL DATA (ug/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
1/31/2006	GMW-25	<2	<2	<2	<5	1274.43
2/22/2006	GMW-25	<2	<2	17	<5	1274.22
3/20/2006	GMW-25	<2	<2	29	51	1274.07
4/19/2006	GMW-25	<2	<2	16	54	1274.09
5/16/2006	GMW-25	<2	<2	10	31	1274.22
6/19/2006	GMW-25	<2	<2	<2	6	1274.36
7/17/2006	GMW-25	<2	3	18	63	1274.39
8/21/2006	GMW-25	<2	9	87	254	1274.40
9/18/2006	GMW-25	<2	9	83	250	1274.25
10/16/2006	GMW-25	<2	10	95	262	1274.19
11/13/2006	GMW-25	<2	10	79	231	1274.05
12/14/2006	GMW-25	<2	<2	<2	25	1273.94
1/15/2007	GMW-25	<2	<2	7	29	1273.80
2/15/2007	GMW-25	<2	<2	9	35	1273.88
3/6/2007	GMW-25	<2	<2	<2	<2	1273.87
4/16/2007	GMW-25	<2	3	11	50	1274.15
5/16/2007	GMW-25	<2	9	33	128	1274.37
6/20/2007	GMW-25	<2	6	23	87	1275.14
7/16/2007	GMW-25	<2	6	23	85	1275.09
8/17/2007	GMW-25	<2	7	30	110	1275.01
9/17/2007	GMW-25	<2	10	38	165	1275.10
10/22/2007	GMW-25	<2	<2	26	91	1275.13
11/19/2007	GMW-25	<2	<2	26	113	1275.52
12/14/2007	GMW-25	<2	<2	35	238	1275.77
1/17/2008	GMW-25	<2	<2	33	164	1275.93
2/22/2008	GMW-25	<2	<2	63	272	1275.76
3/24/2008	GMW-25	<2	<2	66	247	1275.72
4/22/2008	GMW-25	<2	<2	16	51	1275.65
5/14/2008	GMW-25	<2	<2	10	32	1275.66
6/23/2008	GMW-25	<2	<2	13	76	1276.17
7/18/2008	GMW-25	<2	<2	28	330	1276.47
8/18/2008	GMW-25	<2	<2	74	365	1276.69
9/19/2008	GMW-25	<2	<2	72	273	1276.37
10/27/2008	GMW-25	<2	<2	<2	<5	1275.87
11/20/2008	GMW-25	<2	<2	18	75	1276.59
12/18/2008	GMW-25	<2	<2	<2	18	1275.57
1/19/2009	GMW-25	<2	<2	<2	13	1275.36

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
3/11/2009	GMW-25	<1	<1	2	9	1274.95
6/25/2009	GMW-25	<2	7	26	128	1274.87
9/17/2009	GMW-25	<2	2	18	346	1275.86
11/6/2009	GMW-25	1	<1	2	98	1275.71
3/18/2010	GMW-25	1	<1	15	306	1276.13
6/17/2010	GMW-25	<0.5	<1	164	388	1277.31
10/5/2010	GMW-25	<0.195	<0.195	27	264	1280.55
12/7/2010	GMW-25	<0.5	<1	10	56	1280.34
3/2/2011	GMW-25	<0.5	2	242	715	1278.36
6/9/2011	GMW-25	<0.5	<1	91	215	1279.09
9/27/2011	GMW-25	<0.5	<1	123	367	1278.93
12/9/2011	GMW-25	<0.5	<1	38.9	150	1276.86
3/19/2012	GMW-25	<0.5	<1	27.3	44	1275.54
9/26/2012	GMW-25	<0.5	<1	176	542	1274.31
3/26/2013	GMW-25	<0.5	<1	247	657	1273.15
5/3/2013	GMW-25	<0.5	<1	101	263	1273.09
6/26/2013	GMW-25	<0.5	<1	106	239	1273.18
7/24/2013	GMW-25	0.806	1.1	100	250	1273.32
8/28/2013	GMW-25	<0.5	<1	152	410	1273.30
9/25/2013	GMW-25	<0.5	<1	146	381	1273.20
10/28/2013	GMW-25	<0.5	<1	111	311	1273.00
4/21/2014	GMW-25	<0.5	<1	13	51.2	1272.51
8/20/2014	GMW-25	<0.5	<1	54	181	1272.85
10/29/2014	GMW-25	<0.5	<1	91.8	285	1272.99
3/26/2015	GMW-25 (PDB)	<0.5	<1	<1	<3	1273.11
5/13/2015	GMW-25 (PDB)	<0.5	<1	<1	<3	1273.19
10/12/2015	GMW-25 (PDB)	<0.5	<1	<1	<3	1273.25
10/12/2015	GMW-25 (bail)	<0.5	<1	33.5	110	1273.25
12/2/2015	GMW-25 (PDB)	<0.5	<1	<1	<3	1273.25
3/7/2016	GMW25-P1	<0.5	<1	<1	<3	1274.15
3/7/2016	GMW25-P2	<0.5	<1	<1	<3	1274.15
5/24/2016	GMW25 (PDB)	<0.5	<1	<1	<3	1275.73
6/8/2016	GMW25 (bail)	0.588	<1	9.7	74.5	1276.42
7/14/2016	GMW25 (bail)	1.28	<1	8.62	462	1277.40
12/8/2016	GMW25 (bail)	<2	<2	124	291	1276.77
4/13/2017	GMW25 (bail)	<2	<2	53.2	102	1276.41
6/8/2017	GMW25 (PDB)	<2	<2	19.3	94	1277.09

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
6/8/2017	GMW25 (bail)	<2	<2	15.6	75.6	1277.09
7/25/2017	GMW25 (bail)	<2	<2	41.3	118	1277.54
12/12/2017	GMW25 (bail)	<2	<2	15.6	11.0	1276.29
12/19/2017	GMW25 (LF)	<2	<2	13.2	11.6	1276.10
11/23/2004	GMW-26	<2	<2	<2	<5	1273.67
12/14/2004	GMW-26	<2	<2	<2	<5	1273.66
1/18/2005	GMW-26	<2	<2	<2	<5	1274.14
2/28/2005	GMW-26	<2	<2	<2	<5	1274.77
3/16/2005	GMW-26	<2	<2	<2	<5	1274.55
4/7/2005	GMW-26	<2	<2	<2	<5	1274.57
5/24/2005	GMW-26	<2	<2	<2	<5	1275.04
6/20/2005	GMW-26	<2	<2	<2	<5	1275.45
4/12/2006	GMW-26	<2	<2	<2	<5	1274.49
11/23/2004	GMW-27	<2	<2	33	159	1274.44
12/14/2004	GMW-27	<2	<2	<2	<5	1274.55
3/16/2005	GMW-27	<2	<2	61	89	1275.98
4/12/2006	GMW-27	<2	64	143	548	1275.75
11/24/2004	GMW-28	<2	<2	<2	<5	1273.82
12/14/2004	GMW-28	<2	<2	<2	<5	1273.71
3/16/2005	GMW-28	<2	<2	<2	<5	1274.61
4/7/2005	GMW-28	<2	<2	<2	<5	1274.66
5/24/2005	GMW-28	<2	<2	<2	<5	1275.04
6/20/2005	GMW-28	<2	<2	<2	<5	1275.41
4/12/2006	GMW-28	<2	<2	<2	<5	NA
11/24/2004	GMW-29	<2	<2	<2	<5	1273.18
12/14/2004	GMW-29	<2	<2	<2	<5	1273.19
1/18/2005	GMW-29	<2	<2	<2	<5	1273.58
2/28/2005	GMW-29	<2	<2	<2	<5	1273.77
3/16/2005	GMW-29	<2	<2	<2	<5	1273.88
4/7/2005	GMW-29	<2	<2	<2	<5	1273.94
5/24/2005	GMW-29	<2	<2	<2	<5	1274.27
6/20/2005	GMW-29	<2	<2	<2	8	1274.63
12/22/2005	GMW-29	<2	<2	<2	<5	1274.35

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
3/20/2006	GMW-29	<2	<2	<2	<5	1273.77
4/12/2006	GMW-29	<2	<2	<2	<5	NA
11/29/2004	GMW-30	<2	<2	<2	<5	1273.37
12/14/2004	GMW-30	<2	<2	<2	<5	1273.33
1/18/2005	GMW-30	<2	<2	<2	<5	1273.65
2/28/2005	GMW-30	<2	<2	<2	454	1273.90
3/15/2005	GMW-30	10	7	<2	299	1273.96
3/16/2005	GMW-30	6	<2	<2	240	1273.97
4/7/2005	GMW-30	4	<2	<2	27	1274.04
5/24/2005	GMW-30	4	<2	<2	19	1274.41
6/20/2005	GMW-30	<2	<2	<2	<5	1274.75
8/30/2005	GMW-30	<2	<2	<2	<5	1276.53
12/22/2005	GMW-30	<2	<2	<2	<5	1274.44
3/20/2006	GMW-30	<2	<2	<2	<5	1273.84
9/18/2006	GMW-30	<2	<2	<2	<5	1274.08
10/16/2006	GMW-30	<2	<2	<2	<5	1274.00
11/13/2006	GMW-30	<2	<2	<2	<5	1273.84
12/14/2006	GMW-30	<2	<2	<2	<5	1273.73
1/15/2007	GMW-30	<2	<2	<2	<5	1273.61
2/15/2007	GMW-30	<2	<2	<2	<5	1273.66
3/6/2007	GMW-30	<2	<2	<2	<5	1273.68
4/16/2007	GMW-30	<2	<2	<2	<5	1273.91
5/16/2007	GMW-30	<2	<2	<2	<5	1274.15
6/20/2007	GMW-30	<2	<2	<2	<5	1274.61
7/16/2007	GMW-30	<2	<2	<2	<5	1274.90
8/17/2007	GMW-30	<2	<2	<2	<5	1274.85
9/17/2007	GMW-30	<2	<2	<2	<5	1274.91
10/22/2007	GMW-30	<2	<2	<2	<5	1274.99
11/19/2007	GMW-30	<2	<2	<2	<5	1276.32
12/14/2007	GMW-30	<2	<2	<2	<5	1275.60
1/17/2008	GMW-30	<2	<2	<2	<5	1275.73
2/22/2008	GMW-30	<2	<2	<2	<5	1275.55
3/24/2008	GMW-30	2	<2	<2	<5	1275.48
4/22/2008	GMW-30	5	<2	<2	<5	1275.44
5/14/2008	GMW-30	3	<2	<2	<5	1275.48
6/23/2008	GMW-30	2	<2	<2	<5	1275.95

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
7/18/2008	GMW-30	<2	<2	<2	<5	1276.32
8/18/2008	GMW-30	<2	<2	<2	<5	1276.52
9/19/2008	GMW-30	<2	<2	<2	<5	1276.19
10/27/2008	GMW-30	<2	<2	<2	<5	1275.70
11/20/2008	GMW-30	5	<2	<2	<5	1275.42
12/18/2008	GMW-30	<2	<2	<2	<5	1275.34
1/19/2009	GMW-30	<2	<2	<2	<5	1275.14
3/11/2009	GMW-30	<1	<1	<1	2	1274.73
6/25/2009	GMW-30	<2	<2	6	25	1274.66
9/17/2009	GMW-30	<2	<2	7	33	1275.66
11/6/2009	GMW-30	<0.5	<1	<1	<4	1275.46
11/6/2009	GMW-30	<5	<5	<5	<5	1275.46
12/3/2009	GMW-30	<0.5	<2	<2	<3	NA
1/5/2010	GMW-30	<0.5	<1	<1	<6	NA
3/18/2010	GMW-30	<0.5	<1	<1	<7.5	1275.91
6/17/2010	GMW-30	<0.5	<1	<1	<3	1277.10
10/5/2010	GMW-30	<0.195	<0.196	<0.211	<0.407	1280.38
12/7/2010	GMW-30	<0.5	<1	<1	<3	1280.13
3/2/2011	GMW-30	<0.5	<1	<1	<3	1278.07
6/9/2011	GMW-30	<0.5	<1	<1	<3	1278.87
9/27/2011	GMW-30	<0.5	<1	<1	<3	1278.72
12/9/2011	GMW-30	1.16	<1	1.02	<3	1276.64
3/19/2012	GMW-30	<0.5	<1	<1	<3	1275.30
9/26/2012	GMW-30	<0.5	<1	<1	3.21	1274.12
3/26/2013	GMW-30	**5.12**	1.71	**765**	1660	1272.97
5/3/2013	GMW-30	**5.60**	2.59	432	2350	1272.92
6/26/2013	GMW-30	**6.44**	1.79	453	2500	1272.97
7/24/2013	GMW-30	**5.98**	2.30	**731**	2410	1273.11
8/28/2013	GMW-30	**5.86**	1.56	**881**	2510	1273.12
9/25/2013	GMW-30	**7.14**	1.58	**1380**	3740	1273.02
10/28/2013	GMW-30	**8.52**	1.94	**2080**	5250	1272.84
11/18/2013	GMW-30	**12.60**	1.94	**2830**	6670	1272.75
12/27/2013	GMW-30	**10.10**	1.57	**2390**	6320	1272.68
1/22/2014	GMW-30	**13.4**	<1	**4460**	**11700**	1272.55
2/17/2014	GMW-30	**15.5**	<1	**4830**	**12800**	1272.50
3/21/2014	GMW-30	**13.3**	<1	**4590**	**13200**	1272.42
4/21/2014	GMW-30	**9.65**	<1	**2970**	9020	1272.34

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	**WELL #**	**BENZENE**	**TOLUENE**	**E-BENZENE**	**XYLENES**	**Groundwater Elevation**
MCL		**5**	**1000**	**700**	**10000**	**(feet above sea level)**
5/22/2014	GMW-30	**9.14**	<1	**3230**	9710	1272.30
6/20/2014	GMW-30	**8.01**	<1	**2550**	8490	1272.26
7/17/2014	GMW-30	**6.23**	<1	**862**	6960	1272.44
8/20/2014	GMW-30	**5.38**	<1	**892**	6320	1272.65
10/29/2014	GMW-30	4.83	<1	**1590**	7600	1272.81
11/25/2014	GMW-30	**8.94**	<7.5	**1530**	7690	1272.85
3/26/2015	GMW-30 (PDB)	<0.5	<1	20.1	437	1273.01
5/13/2015	GMW-30 (PDB)	<0.5	<1	2.66	59.2	1273.08
10/12/2015	GMW-30 (PDB)	3.87	<1	380	1250	1273.18
10/12/2015	GMW30 (bail)	1.93	<1	**832**	3500	1273.18
12/3/2015	GMW30-P1	<0.5	<1	<1	<3	1273.15
12/3/2015	GMW30-P2	<0.5	<1	<1	<3	"
12/3/2015	GMW30-P3	<0.5	<1	<1	<3	"
12/3/2015	GMW30-P4	<0.5	<1	<1	<3	"
12/3/2015	GMW30 (bail)	2.40	<1	**1040**	4600	1273.15
3/7/2016	GMW30-P1	<0.5	<1	<1	<3	1274.01
3/7/2016	GMW30-P2	<0.5	<1	<1	<3	1274.01
5/24/2016	GMW30 (PDB)	<0.5	<1	<1	<3	1275.59
6/8/2016	GMW30 (bail)	<0.5	<1	<1	<3	1276.28
7/14/2016	GMW30 (bail)	2.34	<1	35.9	66	1277.33
12/8/2016	GMW30 (bail)	<2	<2	111	1220	1276.67
4/13/2017	GMW30 (bail)	<2	<2	67.4	950	1276.30
6/8/2017	GMW30 (PDB)	<2	<2	<2	<6	1276.94
6/8/2017	GMW30 (bail)	<2	<2	2.99	98.9	1276.94
7/25/2017	GMW30 (bail)	<2	<2	6.42	57.7	1277.44
12/12/2017	GMW30 (bail)	2.72	<2	433	2910	1276.18
12/19/2017	GMW30 (LF)	3.02	<2	448	3310	1276.03
11/18/2004	GMW-31	<2	<2	<2	<5	1273.43
12/14/2004	GMW-31	<2	<2	<2	<5	1273.37
1/18/2005	GMW-31	<2	<2	<2	<5	1273.66
2/28/2005	GMW-31	<2	<2	<2	<5	1273.98
3/16/2005	GMW-31	<2	<2	<2	<5	1274.06
4/7/2005	GMW-31	<2	<2	<2	<5	1274.12
5/24/2005	GMW-31	<2	<2	<2	<5	1274.53
6/20/2005	GMW-31	<2	<2	<2	<5	1274.89
12/22/2005	GMW-31	<2	<2	<2	<5	1274.51

GROUNDWATER ANALYTICAL DATA (ug/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
4/12/2006	GMW-31	<2	<2	<2	<5	NA
12/21/2004	GMW-32	<2	<2	<2	<5	NA
5/24/2005	GMW-32	<2	<2	<2	<5	1274.13
6/20/2005	GMW-32	<2	<2	<2	<5	NA
12/22/2005	GMW-32	<2	<2	<2	<5	1274.45
4/12/2006	GMW-32	<2	<2	<2	<5	NA
5/16/2006	GMW-33	<20	**8520**	**21100**	**92300**	1276.26
6/19/2006	GMW-33	<20	**7790**	**21500**	**93900**	1276.13
7/17/2006	GMW-33	<30	**4390**	**8960**	**43700**	1276.19
8/21/2006	GMW-33	<20	**4320**	**11500**	**56400**	1275.98
9/18/2006	GMW-33	<20	**6140**	**12800**	**62900**	1275.80
10/16/2006	GMW-33	<20	**4170**	**12300**	**56000**	1275.90
11/13/2006	GMW-33	<20	**4960**	**11600**	**57700**	1275.64
12/14/2006	GMW-33	<20	**1950**	**6800**	**41900**	1275.55
1/15/2007	GMW-33	<20	**3200**	**9170**	**48700**	1275.57
2/15/2007	GMW-33	<20	**3510**	**10100**	**52400**	1275.65
3/6/2007	GMW-33	<20	**3440**	**10200**	**50300**	1275.79
4/16/2007	GMW-33	<20	822	**7100**	**37300**	1276.26
5/16/2007	GMW-33	<20	106	**1800**	9930	1276.60
6/20/2007	GMW-33	<20	**1310**	**5770**	**23400**	1276.58
7/16/2007	GMW-33	<20	**1270**	**3080**	**14900**	1276.55
7/31/2007	GMW-33	7	683	**2720**	**12800**	1276.44
7/31/2007	GMW-33	<100	990	**3800**	**18000**	1276.44
8/1/2007	GMW-33	<20	855	**2400**	**11500**	1276.44
8/7/2007	GMW-33	<20	**1090**	**2390**	**12800**	1276.40
8/17/2007	GMW-33	<20	893	**3160**	**14000**	1276.38
8/28/2007	GMW-33	<20	755	**2290**	**13300**	1276.33
9/28/2007	GMW-33	9	550	**1850**	**12400**	1276.29
10/22/2007	GMW-33	13	**1320**	**3470**	**12600**	1276.25
11/19/2007	GMW-33	<20	748	**2190**	**10400**	1276.20
12/14/2007	GMW-33	<2	146	584	2750	1277.51
1/17/2008	GMW-33	<2	33	245	658	1277.70
2/22/2008	GMW-33	<2	74	**832**	2300	1277.39
3/24/2008	GMW-33	3	28	**1100**	1680	1277.54
5/14/2008	GMW-33	<2	3	98	215	1276.50

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
6/23/2008	GMW-33	<2	15	169	481	1276.80
7/18/2008	GMW-33	<2	11	215	674	1276.63
8/18/2008	GMW-33	<2	5	223	463	1278.16
9/19/2008	GMW-33	5	437	**3230**	**13600**	1272.56
10/27/2008	GMW-33	4	385	**2380**	**10600**	1272.39
11/20/2008	GMW-33	2	148	**980**	3670	1277.31
12/18/2008	GMW-33	<2	33	399	1190	1277.32
1/19/2009	GMW-33	<2	36	351	909	1277.13
3/11/2009	GMW-33	<1	4	51	167	1276.79
3/11/2009	GMW-33	<2	<2	5	22	1276.79
6/25/2009	GMW-33	<2	20	241	698	1276.58
9/17/2009	GMW-33	<2	3	151	266	1277.49
11/6/2009	GMW-33	1	4	196	337	1277.88
3/18/2010	GMW-33	<0.5	4	2	<7.5	1278.56
6/17/2010	GMW-33	<0.5	<1	2	4	1279.23
10/5/2010	GMW-33	<0.195	<0.196	<0.211	<0.407	1282.20
12/7/2010	GMW-33	<0.5	<1	<1	<3	1281.98
3/2/2011	GMW-33	<0.5	<1	<1	<3	1280.21
6/9/2011	GMW-33	<0.5	<1	<1	4	1281.13
9/27/2011	GMW-33	<0.5	<1	<1	<3	1280.54
12/9/2011	GMW-33	<0.5	<1	1.09	5.76	1278.39
3/19/2012	GMW-33	<0.5	<1	58.5	304	1277.23
9/26/2012	GMW-33	0.71	<1	61.1	273	1275.81
3/26/2013	GMW-33	0.84	<1	126	711	1274.61
5/3/2013	GMW-33	3.37	18.5	638	4100	1274.62
6/26/2013	GMW-33	**6.14**	67.9	**2540**	**11500**	1275.10
7/24/2013	GMW-33	**5.87**	38.9	**3550**	**15000**	1275.16
8/28/2013	GMW-33	4.20	19.7	**2640**	**11400**	1274.98
9/25/2013	GMW-33	4.13	21	**2370**	**10500**	1274.81
10/28/2013	GMW-33	4.20	22	**1940**	**8970**	1274.45
11/18/2013	GMW-33	5.83	36	**2490**	**10500**	1274.31
12/27/2013	GMW-33	5.65	53	**2920**	**12400**	1274.32
1/22/2014	GMW-33	**6.21**	51.3	**3860**	**15400**	1274.10
2/17/2014	GMW-33	**7.26**	45.8	**4060**	**15900**	1274.01
3/21/2014	GMW-33	**8.01**	44.3	**4360**	**16200**	1273.90
4/21/2014	GMW-33	<5	41.7	**5040**	**16900**	1273.78
5/22/2014	GMW-33	**9.13**	44.0	**4830**	**16200**	1273.81

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	**WELL #**	**BENZENE**	**TOLUENE**	**E-BENZENE**	**XYLENES**	**Groundwater Elevation**
MCL		**5**	**1000**	**700**	**10000**	**(feet above sea level)**
6/20/2014	GMW-33	**6.57**	46.1	**4740**	**16000**	1273.97
7/17/2014	GMW-33	**6.06**	109	**4790**	**18400**	1274.40
10/29/2014	GMW-33	<1.10	63.6	**6910**	**23900**	1274.59
11/25/2014	GMW-33	<5.5	64.6	**6060**	**22600**	1274.77
3/26/2015	GMW-33 (PDB)	**5.27**	28.8	**2780**	9230	1274.73
5/13/2015	GMW-33 (PDB)	4.10	<100	**3180**	9510	1275.00
10/12/2015	GMW-33 (PDB)	<5	<10	**2540**	3240	1275.01
12/3/2015	GMW33-P1	<5	<10	**1260**	1460	1275.06
12/3/2015	GMW33-P2	<5	<10	**1200**	1390	"
12/3/2015	GMW33 (bail)	<5	11.5	**2800**	8220	1275.06
3/7/2016	GMW-33 (PDB)	<50	<100	**2040**	6660	1276.53
5/24/2016	GMW33 (PDB)	<0.5	<1	6.44	376	1278.40
6/8/2016	GMW33 (bail)	1.91	1.43	145	308	1279.06
12/19/2016	GMW33 (bail)	<2	<2	21	28	1278.86
6/8/2017	GMW33 (PDB)	<2	<2	<2	<6	1279.49
6/8/2017	GMW33 (bail)	<2	<2	<2	<6	1279.49
12/12/2017	GMW33 (bail)	<2	<2	<2	<6	1278.33
12/19/2017	GMW33 (LF)	<2	<2	35.8	95.7	1277.96
5/16/2006	GMW-34	<2	<2	<2	<5	1276.85
6/19/2006	GMW-34	<2	<2	<2	<5	1276.32
7/17/2006	GMW-34	<2	<2	<2	<5	1276.52
8/21/2006	GMW-34	<2	<2	<2	<5	1276.21
9/18/2006	GMW-34	<2	<2	<2	<5	1276.01
11/13/2006	GMW-34	<2	<2	<2	<5	1275.88
11/19/2007	GMW-34	<2	<2	<2	<5	1277.73
11/20/2008	GMW-34	<2	<2	<2	<5	1277.49
11/6/2009	GMW-34	<0.5	<1	<1	<4	1278.07
10/5/2010	GMW-34	1	<0.196	192	928	1282.44
11/5/2010	GMW-34	2	<1	258	1010	1282.21
12/7/2010	GMW-34	10	<1	**4340**	**12500**	1281.99
3/2/2011	GMW-34	3	<1	**1350**	3770	1280.41
6/9/2011	GMW-34	<2.5	<5	406	1120	1281.31
9/27/2011	GMW-34	<0.5	<1	<1	<3	1280.58
12/9/2011	GMW-34	<0.5	<1	<1	<3	1278.50
3/19/2012	GMW-34	<0.5	<1	<1	<3	1277.32
9/26/2012	GMW-34	<0.5	<1	<1	<3	1275.98

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
3/26/2013	GMW-34	<0.5	<1	<1	<3	1274.76
9/25/2013	GMW-34	4	<1	326	16	1275.01
4/21/2014	GMW-34	<0.5	<1	<1	<3	1273.97
10/29/2014	GMW-34	13.7	<1	**1140**	1360	1274.94
3/26/2015	GMW-34 (PDB)	<0.5	<1	<1	<3	1275.17
5/13/2015	GMW-34 (PDB)	<0.5	<1	<1	<3	1275.27
12/2/2015	GMW-34 (PDB)	<0.5	<1	<1	<3	1275.31
5/24/2016	GMW-34 (PDB)	<0.5	<1	<1	<3	1278.55
12/19/2016	GMW-34 (bail)	<2	<2	<2	<6	1279.19
6/8/2017	GMW-34 (bail)	<2	<2	<2	<6	1279.55
12/12/2017	GMW-34 (bail)	<2	<2	<2	<6	1278.41
5/22/2014	GMW-35	<1	<2	<2	<6	1269.73
6/20/2014	GMW-35	<0.5	<1	<1	<3	1269.71
7/17/2014	GMW-35	<0.5	<1	<1	<3	1269.82
8/20/2014	GMW-35	<0.5	<1	<1	<3	1269.94
10/29/2014	GMW-35	<0.5	<1	<1	<3	1270.00
3/26/2015	GMW-35 (PDB)	<0.5	<1	<1	<3	1270.11
5/13/2015	GMW-35 (PDB)	<0.5	<1	<1	<3	1270.14
10/12/2015	GMW-35 (PDB)	<0.5	<1	<1	<3	1270.03
10/12/2015	GMW-35 (bail)	<0.5	<1	<1	<3	1270.03
12/2/2015	GMW-35 (PDB)	<0.5	<1	<1	<3	1270.20
5/24/2016	GMW-35 (PDB)	<0.5	<1	<1	<3	1271.83
7/14/2016	GMW-35 (bail)	<0.5	<1	<1	<3	1273.15
12/8/2016	GMW-35 (bail)	<2	<2	<2	<6	1272.38
4/13/2017	GMW-35 (bail)	<2	<2	2.29	<6	1272.07
4/21/2017	GMW-35 (bail)	<2	<2	<2	<6	1272.06
7/25/2017	GMW-35 (bail)	<2	<2	<2	<6	1272.98
12/12/2017	GMW-35 (bail)	<2	<2	<2	<6	1271.94
5/22/2014	GMW-36	<1	<2	<2	<6	1271.10
6/20/2014	GMW-36	<0.5	<1	<1	<3	1271.08
7/17/2014	GMW-36	<0.5	<1	<1	<3	1271.22
10/29/2014	GMW-36	<0.5	<1	<1	<3	1271.46
3/26/2015	GMW-36 (PDB)	<0.5	<1	<1	<3	1271.64
5/13/2015	GMW-36 (PDB)	<0.5	<1	<1	<3	1271.71
12/2/2015	GMW-36 (PDB)	<0.5	<1	<1	<3	1271.78

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
5/24/2016	GMW-36 (PDB)	<0.5	<1	<1	<3	1273.99
12/8/2016	GMW-36 (bail)	<2	<2	<2	<6	1275.14
4/13/2017	GMW-36 (bail)	<2	<2	<2	<6	1274.71
12/12/2017	GMW-36 (bail)	<2	<2	<2	<6	1274.53
5/22/2014	GMW-37	<1	<2	<2	<6	1271.55
6/20/2014	GMW-37	<0.5	<1	<1	<3	1271.53
7/17/2014	GMW-37	<0.5	<1	<1	<3	1271.63
10/29/2014	GMW-37	<0.5	<1	<1	<3	1271.93
3/26/2015	GMW-37 (PDB)	<0.5	<1	<1	<3	1272.10
5/13/2015	GMW-37 (PDB)	<0.5	<1	<1	<3	1272.20
12/2/2015	GMW-37 (PDB)	<0.5	<1	<1	<5	1272.25
5/24/2016	GMW-37 (PDB)	<0.5	<1	<1	<3	1274.54
12/8/2016	GMW-37 (bail)	<2	<2	<2	<6	1275.78
4/13/2017	GMW-37 (bail)	<2	<2	<2	<6	1275.34
12/12/2017	GMW-37 (bail)	<2	<2	<2	<6	1275.17
2/11/2016	GMW-38 (bail)	<1	<1	1.1	5.9	1272.95
3/7/2016	GMW-38 (PDB)	<0.5	<1	<1	<3	1273.28
12/8/2016	GMW-38 (bail)	<2	<2	<2	<6	1275.99
4/13/2017	GMW-38 (bail)	<2	<2	<2	<6	1275.58
12/12/2017	GMW-38 (bail)	<2	<2	<2	<6	1275.16
2/11/2016	GMW-39 (bail)	<1	1.1	<1	<3	1273.01
3/7/2016	GMW-39 (PDB)	<0.5	<1	<1	<3	1273.48
12/8/2016	GMW-39 (bail)	<2	<2	<2	<6	1276.05
4/13/2017	GMW-39 (bail)	<2	<2	<2	<6	1275.58
12/12/2017	GMW-39 (bail)	<2	<2	<2	<6	1275.19
2/11/2016	GMW-40 (bail)	<1	<1	<1	<3	1273.84
3/7/2016	GMW-40 (PDB)	<0.5	<1	<1	<3	1274.27
12/8/2016	GMW-40 (bail)	<2	<2	<2	<6	1276.85
4/13/2017	GMW-40 (bail)	<2	<2	<2	<6	1276.48
12/12/2017	GMW-40 (bail)	<2	<2	<2	<6	1276.13
4/7/2016	GMW-41 (bail)	<0.5	<1	<1	<3	1274.09
12/8/2016	GMW-41 (bail)	<2	<2	<2	<6	1276.41

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
4/13/2017	GMW-41 (bail)	<2	<2	<2	<6	1275.99
12/12/2017	GMW-41 (bail)	<2	<2	<2	<6	1275.57
4/7/2016	GMW-42 (bail)	<0.5	<1	<1	<3	1272.82
12/8/2016	GMW-42 (bail)	<2	<2	<2	<6	1274.76
4/13/2017	GMW-42 (bail)	<2	<2	<2	<6	1274.86
12/12/2017	GMW-42 (bail)	<2	<2	<2	<6	1274.02
4/7/2016	GMW-44 (bail)	<0.5	<1	<1	<3	1276.27
12/8/2016	GMW-44 (bail)	<2	<2	<2	<6	1277.50
4/13/2017	GMW-44 (bail)	<2	<2	<2	<6	1277.16
12/12/2017	GMW-44 (bail)	<2	<2	<2	<6	1276.74
3/24/2004	MW-1	<2	<2	<2	<5	1280.93
6/25/2004	MW-1	<2	<2	<2	<5	1281.25
9/27/2004	MW-1	<2	<2	<2	<5	1281.54
12/14/2004	MW-1	<2	<2	<2	<5	1280.48
3/16/2005	MW-1	<2	<2	<2	<5	1280.75
6/20/2005	MW-1	<2	<2	<2	<5	1282.50
12/22/2005	MW-1	<2	<2	<2	<5	1280.43
11/19/2007	MW-1	<2	<2	<2	<5	1282.08
5/14/2008	MW-1	<2	<2	<2	<5	1282.36
8/7/2008	MW-1	<2	<2	<2	<5	1282.23
8/27/2008	MW-1	<2	<2	<2	<5	1281.89
10/27/2008	MW-1	<2	<2	<2	<5	1281.89
11/20/2008	MW-1	<2	<2	<2	<5	1281.79
5/12/2009	MW-1	<2	<2	<2	<3	1281.83
6/25/2009	MW-1	<2	<2	<2	<3	1281.46
9/17/2009	MW-1	<2	<2	<2	<3	1281.72
11/6/2009	MW-1	<0.5	<1	<1	<4	1282.19
9/27/2011	MW-1	<0.5	<1	<1	<3	1283.05
9/26/2012	MW-1	<0.5	<1	<1	<3	1279.55
9/25/2013	MW-1	<0.5	<1	<1	<3	1278.91
8/20/2014	MW-1	<0.5	<1	<1	<3	1279.85
10/29/2014	MW-1	<0.5	<1	<1	<3	1279.79
10/12/2015	MW-1 (PDB)	<0.5	<1	<1	<3	1279.29
10/12/2015	MW-1 (bail)	<0.5	<1	<1	<3	1279.29

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	**WELL #**	**BENZENE**	**TOLUENE**	**E-BENZENE**	**XYLENES**	**Groundwater Elevation**
MCL		**5**	**1000**	**700**	**10000**	**(feet above sea level)**
12/2/2015	MW-1 (PDB)	<0.5	<1	<1	<3	1280.05
7/14/2016	MW-1 (bail)	<0.5	<1	<1	<3	1282.80
12/19/2016	MW-1 (bail)	<2	<2	<2	<6	1282.62
7/25/2017	MW-1 (bail)	<2	<2	<2	<6	1282.45
12/12/2017	MW-1 (bail)	<2	<2	<2	<6	1282.06
10/13/1992	MW-4	**81**	**9620**	**20100**	**99700**	NA
12/30/1992	MW-4	**275**	**8710**	**17800**	**90700**	NA
3/30/1993	MW-4	**<100**	**9190**	**19400**	**92300**	NA
12/11/2002	MW-4R	**80**	**40400**	**129200**	**440000**	NA
6/15/2003	MW-4R	**<20**	**6740**	**16530**	**63900**	NA
12/2/2015	MW-4R (PDB)	**62.7**	**13400**	**18100**	**89700**	1276.26
3/24/2004	MW-5	<2	<2	<2	<5	1275.31
6/25/2004	MW-5	<2	<2	<2	<5	1274.48
9/27/2004	MW-5	<2	<2	<2	<5	1273.41
12/14/2004	MW-5	<2	<2	<2	<5	1274.20
3/16/2005	MW-5	<2	<2	<2	<5	1275.89
6/20/2005	MW-5	<2	<2	<2	<5	1276.87
12/22/2005	MW-5	<2	<2	<2	<5	1276.17
11/13/2006	MW-5	<2	<2	<2	<5	1275.58
11/19/2007	MW-5	<2	<2	<2	<5	NA
11/20/2008	MW-5	<2	<2	<2	<5	1277.24
6/25/2009	MW-5	<2	<2	<2	<3	1276.40
11/6/2009	MW-5	<0.5	<1	<1	<4	1277.30
9/27/2011	MW-5	<0.5	<1	<1	<3	1280.42
9/26/2012	MW-5	<0.5	<1	<1	<3	1275.63
9/25/2013	MW-5	<0.5	<1	<1	<3	1274.67
8/20/2014	MW-5	<0.5	<1	<1	<3	1274.42
10/29/2014	MW-5	<0.5	<1	<1	<3	1274.57
10/12/2015	MW-5 (PDB)	<0.5	<1	<1	<3	1274.90
10/12/2015	MW-5 (bail)	<0.5	<1	<1	<3	1274.90
12/2/2015	MW-5 (PDB)	<0.5	<1	<1	<3	1274.93
7/14/2016	MW-5 (bail)	<0.5	<1	<1	<3	1279.35
12/19/2016	MW-5 (bail)	<2	<2	<2	<6	1278.53
7/25/2017	MW-5 (bail)	<2	<2	<2	<6	1279.33

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
12/12/2017	MW-5 (bail)	<2	<2	<2	<6	1277.81
1/3/2001	TC-6D	5	19	**2100**	6110	NA
3/27/2001	TC-6D	2	21	**2840**	7110	1276.43
6/29/2001	TC-6D	24	95	**8700**	**17300**	1276.32
10/17/2001	TC-6D	65	580	**15200**	**45700**	1275.55
12/14/2001	TC-6D	<20	270	**10900**	**28400**	1276.51
3/29/2002	TC-6D	<20	<20	**9790**	**20500**	1276.83
6/27/2002	TC-6D	<20	102	**9550**	**14800**	1275.51
9/26/2002	TC-6D	15	370	**10100**	**25900**	NA
12/11/2002	TC-6D	<2	<2	230	483	NA
3/26/2003	TC-6D	<20	116	**1400**	**34300**	1275.77
6/12/2003	TC-6D	<20	180	**11900**	**19800**	1276.55
8/15/2003	TC-6D	<20	127	**6970**	**17900**	1275.68
12/2/2003	TC6D	<20	151	**4870**	**11900**	1275.76
3/24/2004	TC6D	<20	<20	**9820**	**15200**	1276.57
6/25/2004	TC6D	<2	<2	**3960**	4580	1274.85
9/27/2004	TC6D	<2	<2	**1010**	1180	1274.80
12/14/2004	TC6D	<2	<2	28	43	1274.57
12/30/2004	TC6D	<2	<2	23	58	NA
1/18/2005	TC6D	<2	<2	49	85	1276.90
2/28/2005	TC6D	<2	31	**4220**	7730	1277.07
3/16/2005	TC6D	<2	<2	**7170**	**19800**	1277.07
4/7/2005	TC6D	13	19	**6260**	**10700**	1277.10
5/24/2005	TC6D	<20	<20	**7230**	**14100**	1277.94
6/20/2005	TC6D	<20	<20	**8030**	**15600**	1278.26
8/12/2005	TC6D	<20	<20	**11740**	**17990**	1278.84
9/29/2005	TC6D	<20	<20	**11200**	**22500**	1278.20
10/24/2005	TC6D	<20	<20	**12600**	**33300**	1277.86
12/22/2005	TC6D	<20	186	**15300**	**46100**	1277.27
3/20/2006	TC6D	<20	186	**10500**	**30300**	1276.64
6/19/2006	TC6D	<20	<20	**14900**	**44200**	1277.11
9/18/2006	TC6D	<20	<20	**9260**	**24800**	1276.57
11/13/2006	TC6D	<20	<20	**9070**	**23800**	1276.55
3/6/2007	TC6D	<20	<20	**5670**	**12600**	1276.83
6/20/2007	TC6D	<20	<20	**5320**	**12500**	1277.71
11/19/2007	TC6D	<20	82	**6620**	**24100**	1278.40

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
3/24/2008	TC6D	<20	26	8630	28100	1276.58
6/23/2008	TC6D	<20	426	8880	31300	1278.82
9/19/2008	TC6D	15	240	10200	41400	1278.10
11/20/2008	TC6D	14	335	8850	35000	1278.13
3/11/2009	TC6D	<25	860	16450	65770	1277.76
6/25/2009	TC6D	18	292	11800	32100	1277.41
9/17/2009	TC6D	17	186	14700	56500	1278.27
11/6/2009	TC6D	18	131	18700	75200	1278.88
3/18/2010	TC6D	16	26	17700	60900	1279.83
6/17/2010	TC6D	<50	<100	16900	58400	1280.20
10/5/2010	TC6D	<50	<100	22300	79800	1282.96
12/7/2010	TC6D	17	63	19200	74100	1282.53
3/2/2011	TC6D	<50	<100	17100	67300	1281.12
6/9/2011	TC6D	<50	<100	16800	61800	1282.02
9/27/2011	TC6D	<50	<100	13500	54200	1281.11
12/9/2011	TC6D	<50	<100	16200	55000	1278.97
3/19/2012	TC6D	<50	<100	15700	54300	1277.95
9/26/2012	TC6D	<50	<100	14900	54200	1276.50
3/26/2013	TC6D	22.1	30.5	19500	71500	1275.26
9/25/2013	TC6D	<50	<100	17800	57200	1275.60
4/21/2014	TC6D	22	98	18200	70000	1274.47
10/29/2014	TC6D	15.4	2.48	11200	36800	1275.48
3/26/2015	TC6D (PDB)	10.1	<10	2510	7530	1275.86
5/13/2015	TC6D (PDB)	5.28	<1	961	3420	1275.95
12/3/2015	TC6D (PDB)	27.5	268	9340	32700	1276.05
12/3/2015	TC6D (bail)	24.9	355	12800	50000	1276.05
5/24/2016	TC6D (PDB)	10.2	<1	3550	9610	1279.17
12/19/2016	TC6D (bail)	9.32	2.91	10400	33700	1279.35
6/8/2017	TC6D (bail)	7.18	2.91	7300	22400	1280.23
7/25/2017	TC6D (bail)	8.79	46	10800	35300	1280.22
12/12/2017	TC6D (bail)	<20	<20	6960	21600	1278.90
6/27/2002	TC-6S	<2	<2	<2	24	NA
9/26/2002	TC-6S	<2	<2	<2	<5	NA
12/11/2002	TC-6S	<2	<2	<2	<5	NA
3/26/2003	TC-6S	<2	<2	<2	<5	1296.00
6/12/2003	TC-6S	<2	<2	<2	<5	1301.72

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
8/15/2003	TC-6S	<2	<2	<2	<5	1300.97
12/2/2003	TC-6S	<2	<2	<2	<5	1296.19
3/24/2004	TC-6S	<2	<2	<2	<5	1299.33
6/25/2004	TC-6S	<2	<2	<2	<5	1303.30
9/27/2004	TC-6S	<2	<2	<2	<5	1303.61
12/14/2004	TC-6S	<2	<2	<2	<5	NA
3/16/2005	TC-6S	<2	<2	<2	<5	1301.43
6/20/2005	TC-6S	<2	<2	<2	<5	1303.35
12/22/2005	TC-6S	<2	<2	<2	<5	1296.76
11/13/2006	TC-6S	<2	<2	<2	<5	1297.03
11/19/2007	TC-6S	<2	<2	<2	<5	1302.65
11/20/2008	TC-6S	<2	<2	<2	<5	1302.18
11/20/2008	TC-6S	<0.5	<1	<1	<4	1302.18
10/5/2010	TC-6S	<0.195	<0.196	<0.211	1	1305.31
9/27/2011	TC-6S	<0.5	<1	<1	<3	1299.20
9/25/2013	TC-6S	<0.5	<1	<1	<3	1293.27
10/29/2014	TC-6S	<0.5	<1	<1	<3	1296.50
12/2/2015	TC-6S (bail)	<0.5	<1	<1	<3	1298.40
12/19/2016	TC-6S (bail)	<2	<2	<2	<6	1303.12
3/24/2004	TC-7	<2	<2	<2	<5	1279.52
6/25/2004	TC-7	<2	<2	<2	<5	1280.39
9/27/2004	TC-7	<2	<2	<2	<5	1280.96
12/14/2004	TC-7	<2	<2	<2	<5	1280.45
3/16/2005	TC-7	<2	<2	<2	<5	1278.92
6/20/2005	TC-7	<2	<2	<2	<5	1280.09
12/22/2005	TC-7	<2	<2	<2	<5	1278.49
11/13/2006	TC-7	<2	<2	<2	<5	1278.09
11/19/2007	TC-7	<2	<2	<2	<5	1279.84
11/20/2008	TC-7	<2	<2	<2	<5	1279.28
11/6/2009	TC-7	<0.5	<1	<1	<4	1281.04
11/6/2009	TC-7	<5	<5	<5	<5	1281.04
10/5/2010	TC-7	<0.195	<0.196	<0.211	<0.407	1281.25
9/27/2011	TC-7	1.75	49	166	172	1276.69
3/19/2012	TC-7	<0.5	<1	188	329	1278.49
9/26/2012	TC-7	<0.5	<1	<1	<3	1276.72
9/25/2013	TC-7	<0.5	<1	<1	<3	1276.23

GROUNDWATER ANALYTICAL DATA (ug/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
10/29/2014	TC-7	<0.5	<1	<1	<3	1277.43
5/13/2015	TC-7 (PDB)	<0.5	<1	<1	<3	1277.60
12/2/2015	TC-7 (PDB)	<0.5	<1	<1	<3	1278.18
12/19/2016	TC-7 (bail)	<2	<2	<2	<6	1279.54
7/25/2017	TC-7 (bail)	<2	<2	<2	<6	1279.13
12/13/2017	TC-7 (bail)	<2	<2	<2	<6	1279.03
3/29/2002	TC-17S	<2	<2	<2	<5	NA
6/27/2002	TC-17S	<2	<2	<2	10	1301.03
9/26/2002	TC-17S	<2	<2	<2	<5	NA
12/11/2002	TC-17S	<2	<2	<2	<5	NA
3/26/2003	TC-17S	<2	<2	<2	<5	1295.29
6/12/2003	TC-17S	<2	<2	<2	<5	1301.61
8/15/2003	TC-17S	<2	<2	<2	<5	1300.23
5/16/2007	TC-17S	<2	<2	<2	<5	NA
7/16/2007	TC-17S	<2	<2	<2	<5	1300.06
3/2/2017	TC-17D (bail)	3.48	2.12	**1490**	3800	1279.21
12/12/2017	TC-17D (bail)	3.56	<2	**860**	1680	1279.21
3/24/2004	TC22D	<2	<2	<2	<2	1276.87
6/25/2004	TC22D	<2	<2	<2	<2	1275.81
9/27/2004	TC22D	<2	<2	<2	<2	1275.61
12/14/2004	TC22D	<2	<2	<2	<2	1275.46
3/16/2005	TC22D	<2	<2	<2	<2	1277.39
6/20/2005	TC22D	<2	<2	<2	<2	1278.65
12/22/2005	TC22D	<2	<2	<2	<2	1277.60
11/13/2006	TC22D	<2	<2	<2	<2	1276.80
6/20/2007	TC22D	<2	<2	<2	<2	NA
11/20/2008	TC22D	<2	<2	6	46	NA
10/5/2010	TC22D	<0.195	<0.196	<0.211	<0.407	1283.10
12/2/2015	TC22D (bail)	<0.5	<1	<1	<3	1276.06
12/19/2016	TC22D (bail)	<2	<2	<2	<6	1279.94
12/12/2017	TC22D (bail)	<2	<2	<2	<6	1279.44
11/19/2007	TC22S	<2	<2	<2	<2	1299.00
11/6/2009	TC22S	<0.5	<1	<1	<4	1299.31

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
9/27/2011	TC22S	<0.5	<1	<1	<3	1294.97
12/2/2015	TC22S (bail)	<0.5	<1	<1	<3	1294.25
5/15/1986	TC-23	NA	<1	<1	<1	1279.30
8/20/1986	TC-23	NA	<1	<1	3	1279.80
11/25/1986	TC-23	NA	<1	<1	<1	1278.60
2/17/1987	TC-23	NA	<1	<1	<1	1278.00
6/15/1987	TC-23	NA	12	<1	<	1278.80
9/2/1987	TC-23	<5	<1	<1	<1	1278.90
12/17/1987	TC-23	<1	<1	<1	<1	1277.60
4/7/1988	TC-23	<1	<1	<1	<1	1277.00
7/19/1988	TC-23	NA	<1	<1	<1	1276.50
10/12/1988	TC-23	NA	<1	<1	<1	1276.30
1/18/1989	TC-23	NA	<1	<1	<1	1276.30
4/12/1989	TC-23	NA	<1	<1	<1	1275.68
7/24/1989	TC-23	NA	<2	<2	<5	1273.18
10/17/1989	TC-23	NA	<2	<2	<5	1272.78
1/10/1990	TC-23	NA	<2	<2	<5	1274.38
7/31/1990	TC-23	NA	<2	<2	<5	1274.78
7/24/1991	TC-23	NA	<2	<2	<5	1282.58
11/12/1991	TC-23	NA	<2	<2	<5	1273.78
3/24/1992	TC-23	<1	<1	<1	<1	NA
3/26/1992	TC-23	<1	<1	<1	<1	NA
6/18/1992	TC-23	<5	<5	<5	<10	1273.12
12/30/1992	TC-23	<1	<1	<1	<1	1274.99
3/30/1993	TC-23	<1	6	<1	<1	1276.17
6/8/1993	TC-23	<5	<5	<5	<10	1277.68
3/23/1994	TC-23	<2	<2	<2	<5	1277.91
6/29/1994	TC-23	<2	<2	<2	<5	1277.91
9/27/1994	TC-23	<2	<2	<2	<5	NA
11/23/1994	TC-23	<2	<2	<2	<5	1275.43
2/24/1995	TC-23	<2	<2	<2	<5	NA
6/29/1995	TC-23	<2	<2	<2	<5	1277.93
9/27/1995	TC-23	<2	<2	<2	<5	1277.82
12/4/1995	TC-23	<2	<2	<2	<5	1277.47
2/28/1996	TC-23	<2	<2	<2	<5	1278.10
7/2/1996	TC-23	<2	<2	<2	<5	1276.66

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
9/30/1996	TC-23	<2	<2	<2	<5	1276.77
3/26/1997	TC-23	<2	<2	<2	<5	1278.93
6/17/1997	TC-23	<2	<2	<2	<5	NA
8/28/1997	TC-23	<2	<2	<2	<5	NA
11/12/1997	TC-23	<2	<2	2	<5	NA
3/20/1998	TC-23	<2	<2	<2	<5	NA
6/17/1998	TC-23	<2	<2	<2	<5	1280.23
9/17/1998	TC-23	<2	<2	<2	<5	1278.65
12/15/1998	TC-23	<2	<2	<2	<5	1279.22
3/26/1999	TC-23	<2	<2	<2	<5	1279.74
6/23/1999	TC-23	<2	<2	<2	<5	NA
9/29/1999	TC-23	<2	<2	<2	<5	1279.45
12/23/1999	TC-23	<2	<2	6	10	1278.52
3/29/2000	TC-23	<2	<2	<2	<5	1277.43
7/21/2000	TC-23	<2	<2	<2	<5	NA
1/3/2001	TC-23	<2	<2	<2	<5	NA
3/27/2001	TC-23	<2	<2	<2	<5	1275.65
6/29/2001	TC-23	<2	<2	<2	<5	1275.43
10/4/2001	TC-23	<2	<2	<2	<5	1275.29
12/14/2001	TC-23	<2	<2	<2	<5	1275.84
3/29/2002	TC-23	<2	<2	<2	<5	1276.15
6/27/2002	TC-23	<2	<2	<2	<5	1275.39
9/26/2002	TC-23	<2	<2	<2	<5	NA
12/11/2002	TC-23	<2	<2	<2	<5	NA
3/26/2003	TC-23	<2	<2	<2	<5	1275.09
6/12/2003	TC-23	<2	<2	<2	<5	1275.78
8/14/2003	TC-23	<2	<2	<2	<5	1275.62
12/2/2003	TC-23	<2	<2	<2	<5	1275.48
3/24/2004	TC-23	<2	<2	<2	<5	1275.75
6/25/2004	TC-23	<2	<2	<2	<5	1274.86
9/27/2004	TC-23	<2	<2	<2	<5	1274.87
12/14/2004	TC-23	<2	<2	<2	<5	1274.65
3/16/2005	TC-23	<2	<2	<2	<5	1276.29
6/20/2005	TC-23	<2	<2	<2	<5	1277.40
12/22/2005	TC-23	<2	<2	<2	<5	1276.60
11/23/2006	TC-23	<2	<2	5	24	1275.83
11/19/2007	TC-23	<2	<2	<2	6	1277.72

GROUNDWATER ANALYTICAL DATA (µg/L)						
VOGEL PAINT & WAX CO., MAURICE, IOWA						
DATE	WELL #	BENZENE	TOLUENE	E-BENZENE	XYLENES	Groundwater Elevation
MCL		5	1000	700	10000	(feet above sea level)
11/20/2008	TC-23	<2	<2	46	252	1277.36
11/6/2009	TC-23	<0.5	<1	<1	<4	1277.99
10/5/2010	TC-23	<0.195	<0.196	<0.211	<0.407	1282.30
9/27/2011	TC-23	<0.5	<1	<1	<3	1280.69
9/26/2012	TC-23	<0.5	<1	<1	<3	1275.91
9/25/2013	TC-23	<0.5	<1	<1	<3	1274.98
10/29/2014	TC-23	<0.5	<1	<1	<3	1274.61
12/2/2015	TC-23 (PDB)	<0.5	<1	<1	<3	1275.21
12/19/2016	TC-23 (bail)	<2	<2	<2	<6	1278.94
12/12/2017	TC-23 (bail)	<2	<2	<2	<6	1278.49
Notes:	All samples prior to 2015 (2014 and previous) were collected by conventional bailing.					
	Samples collected from 2015 to the present are designated as being collected by conventional bailing (bail)					
	or passive-diffusion bag (PDB or P) or low-flow (LF) sampling.					

TABLE 6 - GROUNDWATER METALS ANALYTICAL DATA VOGEL PAINT WASTE SITE GEOTEK #91-400						
Sample Date	**Well #**	**Arsenic (mg/L)**	**Cadmium (mg/L)**	**Chromium (mg/L)**	**Lead (mg/L)**	**Mercury (mg/L)**
IDNR	*MCL*	*0.01000*	*0.00500*	*0.10000*	*0.01500*	*0.00200*
IDNR	*NPG*	*0.05000*	*0.02500*	*0.50000*	*0.07500*	*0.01000*
12/23/1999	GMW-3	**0.013**	0.0017	0.030	**0.053**	<0.0002
12/23/1999	GMW-4	**0.010**	0.0005	0.020	**0.024**	<0.0002
05/13/2015	GMW-4	<0.002	<0.0005	<0.005	<0.0005	<0.0002
05/24/2016	GMW-4	<0.002	<0.0005	0.00705	<0.0005	<0.0002
07/25/2017	GMW-4	<0.002	<0.0005	<0.005	0.000536	<0.0002
06/15/2018	GMW-4	<0.002	<0.0005	<0.005	<0.0005	<0.0002
05/13/2015	TC-7	<0.002	<0.0005	<0.005	<0.0005	<0.0002
05/24/2016	TC-7	<0.002	<0.0005	<0.005	<0.0005	<0.0002
07/25/2017	TC-7	0.00412	<0.0005	<0.005	<0.0005	<0.0002
06/14/2018	TC-7	<0.002	<0.0005	<0.005	<0.0005	<0.0002
11/06/2009	GMW-7R	<0.01	<0.001	<0.01	<0.01	<0.001
10/06/2010	GMW-7R	0.00604	<0.0005	<0.002	<0.004	<0.0002
09/27/2011	GMW-7R	0.00513	<0.0005	<0.002	<0.004	<0.0002
09/26/2012	GMW-7R	0.00575	<0.0005	<0.005	0.00266	<0.000267
09/25/2013	GMW-7R	0.00820	<0.0005	<0.005	<0.0005	<0.0002
10/29/2014	GMW-7R	0.00707	<0.0005	<0.005	<0.0005	<0.0002
05/13/2015	GMW-7R	0.00996	<0.0005	<0.005	<0.0005	<0.0002
05/24/2016	GMW-7R	<0.002	<0.0005	<0.005	<0.0005	<0.0002
07/25/2017	GMW-7R	<0.002	<0.0005	<0.005	<0.0005	<0.0002
06/14/2018	GMW-7R	<0.002	<0.0005	<0.005	<0.0005	<0.0002
12/22/2005	GMW-9R	**0.091**	0.002	0.070	**0.060**	0.0007
11/13/2006	GMW-9R	**0.010**	<0.001	0.010	<0.01	<0.0002
11/19/2007	GMW-9R	**0.050**	0.002	0.060	**0.040**	<0.0002
12/18/2008	GMW-9R	**0.020**	<0.001	<0.01	<0.01	<0.001
11/06/2009	GMW-9R	<0.01	<0.001	<0.01	<0.01	<0.001
10/05/2010	GMW-9R	0.00898	<0.0005	<0.002	<0.004	<0.0002
09/27/2011	GMW-9R	**0.0248**	<0.0005	<0.002	<0.004	<0.0002
09/26/2012	GMW-9R	**0.0252**	<0.0005	<0.005	0.00506	<0.000267
09/25/2013	GMW-9R	**0.0272**	<0.0005	<0.005	<0.0005	<0.0002
10/29/2014	GMW-9R	**0.0203**	<0.0005	<0.005	<0.0005	<0.0002
05/13/2015	GMW-9R	0.00663	<0.0005	<0.005	<0.0005	<0.0002
05/24/2016	GMW-9R	<0.002	<0.0005	<0.005	<0.0005	<0.0002
07/25/2017	GMW-9R	0.00509	<0.0005	<0.005	<0.0005	<0.0002
06/14/2018	GMW-9R	0.00499	<0.0005	<0.005	<0.0005	<0.0002
12/13/1999	GMW-12	<0.005	<0.0005	<0.01	0.002	<0.0002
03/29/2002	GMW-13	<0.01	0.004	**0.160**	**0.290**	**0.0092**
06/27/2002	GMW-13	<0.01	<0.001	0.010	**0.020**	**0.0105**
09/26/2002	GMW-13	<0.01	<0.001	0.040	**0.050**	**0.010**
12/11/2002	GMW-13	**0.010**	0.004	0.060	**0.080**	**0.010**
03/26/2003	GMW-13	<0.01	0.002	0.070	**0.090**	**0.010**
06/12/2003	GMW-13	<0.01	0.002	0.060	**0.090**	**0.009**
08/29/2003	GMW-13	<0.01	0.001	0.030	**0.040**	**0.007**
12/02/2003	GMW-13	<0.01	<0.006	<0.01	**0.050**	**0.020**
03/24/2004	GMW-13	<0.01	0.001	0.040	**0.060**	**0.040**
06/25/2004	GMW-13	<0.01	<0.001	0.020	**0.030**	**0.030**

TABLE 6 - GROUNDWATER METALS ANALYTICAL DATA VOGEL PAINT WASTE SITE GEOTEK #91-400

Sample Date	Well #	Arsenic (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Lead (mg/L)	Mercury (mg/L)
IDNR	*MCL*	*0.01000*	*0.00500*	*0.10000*	*0.01500*	*0.00200*
IDNR	*NPG*	*0.05000*	*0.02500*	*0.50000*	*0.07500*	*0.01000*
09/27/2004	GMW-13	<0.01	<0.001	0.020	0.010	**0.030**
12/14/2004	GMW-13	<0.01	0.001	0.020	**0.050**	**0.040**
03/15/2005	GMW-13	**0.010**	0.002	0.040	**0.070**	**0.030**
06/20/2005	GMW-13	0.009	0.002	0.010	**0.050**	**0.390**
12/22/2005	GMW-13	0.005	0.001	0.010	0.010	0.0002
05/13/2015	GMW-13	<0.002	<0.0005	<0.005	<0.0005	0.000264
05/24/2016	GMW-13	0.00239	<0.0005	<0.005	<0.0005	<0.0002
07/25/2017	GMW-13	0.00213	<0.0005	<0.005	<0.0005	<0.0002
06/14/2018	GMW-13	0.00400	<0.0005	<0.005	<0.0005	<0.0002
03/29/2002	GMW-14	<0.01	**0.006**	**0.16**	**0.090**	**0.0197**
06/27/2002	GMW-14	**0.020**	<0.001	0.04	0.010	**0.0062**
09/26/2002	GMW-14	**0.030**	0.002	0.08	**0.030**	**0.038**
12/11/2002	GMW-14	**0.020**	0.003	0.07	**0.020**	**0.020**
03/26/2003	GMW-14	**0.030**	0.004	**0.11**	**0.050**	**0.030**
06/12/2003	GMW-14	<0.01	<0.001	0.01	<0.01	**0.010**
08/29/2003	GMW-14	<0.01	0.001	0.04	<0.01	**0.007**
06/25/2004	GMW-14	<0.01	<0.001	0.02	<0.01	**0.009**
11/06/2009	GMW-15	<0.01	<0.001	<0.01	<0.01	<0.001
11/06/2009	GMW-15	0.0080	<0.001	<0.01	<0.001	<0.00005
10/08/2010	GMW-15	**0.0212**	<0.0005	0.00205	<0.004	<0.0002
09/27/2011	GMW-15	**0.0171**	<0.0005	<0.002	<0.004	<0.0002
09/26/2012	GMW-15	**0.0246**	<0.0005	<0.005	0.00355	<0.000267
09/25/2013	GMW-15	**0.0213**	<0.0005	<0.005	<0.0005	<0.0002
10/29/2014	GMW-15	**0.0194**	<0.0005	<0.005	<0.0005	<0.0002
05/13/2015	GMW-15	**0.0187**	<0.0005	<0.005	<0.0005	<0.0002
05/24/2016	GMW-15	<0.002	<0.0005	<0.005	<0.0005	<0.0002
07/25/2017	GMW-15	<0.002	<0.0005	<0.005	<0.0005	<0.0002
06/14/2018	GMW-15	<0.002	<0.0005	<0.005	<0.0005	<0.0002
12/23/1999	MW-1	<0.005	<0.0005	<0.01	0.002	<0.0002
12/11/2002	MW-1	<0.01	<0.001	<0.01	<0.01	<0.0002
03/26/2003	MW-1	<0.01	<0.001	<0.01	<0.01	<0.0002
06/12/2003	MW-1	<0.01	<0.001	<0.01	<0.01	<0.0002
08/29/2003	MW-1	<0.01	<0.001	<0.01	<0.01	<0.0002
12/02/2003	MW-1	<0.01	<0.006	<0.01	<0.03	<0.0002
03/24/2004	MW-1	<0.01	<0.001	<0.01	<0.01	<0.0002
06/25/2004	MW-1	<0.01	<0.001	<0.01	<0.01	<0.0002
09/27/2004	MW-1	<0.01	<0.001	<0.01	<0.01	<0.0002
12/14/2004	MW-1	<0.01	<0.001	<0.01	<0.01	<0.0002
03/16/2005	MW-1	<0.01	<0.001	<0.01	<0.01	<0.0002
06/20/2005	MW-1	<0.005	<0.001	<0.01	<0.01	<0.0002
03/26/2003	TC-6D	**0.010**	<0.001	<0.01	<0.01	<0.0002
06/12/2003	TC-6D	<0.01	<0.001	0.020	<0.01	<0.0002
08/29/2003	TC-6D	<0.01	<0.001	0.010	<0.01	<0.0002
12/02/2003	TC-6D	**0.020**	<0.01	<0.01	<0.03	<0.0002
03/24/2004	TC-6D	<0.01	<0.001	0.030	<0.01	<0.0002
06/25/2004	TC-6D	<0.01	<0.001	0.040	<0.01	<0.0002
09/27/2004	TC-6D	**0.010**	<0.001	0.050	<0.01	<0.0002
12/14/2004	TC-6D	<0.01	<0.001	0.030	<0.01	<0.0002

TABLE 6 - GROUNDWATER METALS ANALYTICAL DATA VOGEL PAINT WASTE SITE GEOTEK #91-400

Sample Date	Well #	Arsenic (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Lead (mg/L)	Mercury (mg/L)
IDNR	*MCL*	*0.01000*	*0.00500*	*0.10000*	*0.01500*	*0.00200*
IDNR	*NPG*	*0.05000*	*0.02500*	*0.50000*	*0.07500*	*0.01000*
03/16/2005	TC-6D	<0.01	<0.001	0.020	<0.01	<0.0002
06/20/2005	TC-6D	**0.017**	<0.001	0.010	<0.01	<0.0002
12/22/2005	TC-6D	**0.015**	<0.001	<0.01	<0.01	<0.0002
11/13/2006	TC-6D	**0.020**	<0.001	<0.01	<0.01	<0.0002
11/19/2007	TC-6D	**0.020**	<0.001	<0.01	<0.01	<0.0002
12/18/2008	TC-6D	**0.020**	<0.001	<0.01	<0.01	<0.001
11/06/2009	TC-6D	<0.10	<0.001	<0.01	<0.01	<0.001
10/05/2010	TC-6D	**0.0188**	<0.0005	<0.002	<0.004	<0.0002
09/27/2011	TC-6D	**0.0140**	<0.0005	<0.002	<0.004	<0.0002
09/26/2012	TC-6D	**0.0171**	<0.0005	<0.005	<0.0005	<0.000267
09/25/2013	TC-6D	**0.0151**	<0.0005	<0.005	<0.0005	<0.0002
10/29/2014	TC-6D	**0.0117**	<0.0005	<0.005	<0.0005	<0.0002
05/13/2015	TC-6D	0.00601	<0.0005	<0.005	<0.0005	<0.0002
05/24/2016	TC-6D	0.00442	<0.0005	<0.005	<0.0005	<0.0002
07/25/2017	TC-6D	0.00453	<0.0005	<0.005	0.00253	<0.0002
06/14/2018	TC-6D	<0.00200	<0.0005	<0.005	<0.0005	<0.0002

Bold numbers = exceeds MCL limits

MCL = Maximum Contaminant Level for a protected groundwater source; NPG = Non-protected Groundwater

TABLE 7
YEARLY FIELD AND LABORATORY WATER QUALITY PARAMETER DATA

Date	Monitoring Well ID	Groundwater Depth (ft)	Temp. (°C)	pH	Redox (mV)	Conductivity (mS/cm)	DO (mg/L)	Nitrate (mg/L)	Sulfate (mg/L)	Fe^{3+} (mg/L)	Fe^{2+} (mg/L)	Mn^{2+} (mg/L)	Total Mn (mg/L)	Alkalinity as $CaCO_3$ (mg/L)	Methane (µg/L)
06/29/2009	GMW-7R	40.96	10.25	7.3	-192	530	1.06	0	47		2.23				82
09/17/2009	GMW-7R	40.02	12.84	7.07	-178	542	1.01	2.1	57		1.44				--
11/06/2009	GMW-7R	39.71	13.01	6.84	-164.5	565	1.84	1.2	64		0.64				--
05/10/2010	GMW-7R	38.61	9.50	7.64	2.2	898	1.58	0	94		2.12				--
06/24/2010	GMW-7R	38.29	9.48	6.73	80.3	833	1.78	1.6	29		0.26				--
10/20/2010	GMW-7R	35.29	9.37	8.0	-26.9	783	2.1	0.8	24		0.44				--
06/02/2011	GMW-7R	36.59	9.91	7.61	50.1	673	6.29	0	18		1.14				--
07/24/2012	GMW-7R	40.90	10.61	6.8	-142	474	3.1	0	9		0.94				120
07/24/2013	GMW-7R	42.38	10.70	7.7	**	776	3.7	0	5		0.97				201
08/20/2014	GMW-7R	42.92	12.14	6.87	**	335	1.45	0	<5		<0.100				94.5
10/12/2015	GMW-7R	42.52	9.78	7.52	-79.3	800	1.7	<0.1	27.9		0.186				170
07/14/2016	GMW-7R	38.12	9.83	8.0	46	817	0.61	<0.1	46.5	2.38	<0.1	0.831	1.04	366	353
07/25/2017	GMW-7R	38.03	9.89	7.09	62	799	2.41	<0.1	23.9	4.13	0.201	0.966	1.18	438	96.4
06/29/2009	GMW-9R	24.03	10.82	7.14	-167	618	1.31	0	14		3.17				146
09/17/2009	GMW-9R	24.61	12.63	7.01	-152	603	1.11	1.4	28		3.08				--
11/06/2009	GMW-9R	22.03	12.97	6.81	-136.9	579	1.15	0	35		3				--
05/10/2010	GMW-9R	21.29	9.92	7.42	-11.1	1127	1.89	0	9		9.15				--
06/24/2010	GMW-9R	20.97	9.62	7.07	45	848	1.93	4.7	40		3.11				--
10/20/2010	GMW-9R	18.77	10.79	7.4	-19.8	905	1.94	0	32		6.24				--
06/02/2011	GMW-9R	19.19	9.95	7.77	59	543	14.09	3.4	19		8.3				--
07/24/2012	GMW-9R	23.88	11.29	6.93	-102	522	3.31	2	0		10				550
07/24/2013	GMW-9R	25.13	13.53	7.89	**	1110	4.25	0	18		10				427
08/20/2014	GMW-9R	25.61	11.60	6.02	**	881	0.71	0	21.7		0.175				83.4
10/12/2015	GMW-9R	25.48	10.70	7.40	-128.7	864	1.4	<0.1	46.2		1.35				107
07/14/2016	GMW-9R	21.33	10.49	7.58	17.5	1143	0.50	0.299	26.1	14	0.156	10.4	12.1	592	430
07/25/2017	GMW-9R	21.42	9.58	7.16	-28	1249	2.75	<0.1	2.55	15.6	<0.1	1.14	2.04	520	262
06/29/2009	GMW-13	18.14	9.47	7.03	-83	668	1.09	0	6		3.14				347
09/17/2009	GMW-13	18.47	11.37	6.91	-98.5	622	0.81	5.6	0		3				--
11/06/2009	GMW-13	16.70	12.93	6.79	-114	566	1.04	4.4	0		3				--
05/10/2010	GMW-13	15.97	8.78	7.3	7.48	1091	1.72	0.3	0		8.4				--
06/24/2010	GMW-13	15.65	9.34	6.82	63.7	1113	2.25	3	7		7.38				--
10/20/2010	GMW-13	14.19	11.95	7.3	-18.1	1050	1.58	3.2	0		6.25				--
06/02/2011	GMW-13	13.78	9.11	7.48	10.5	683	6.51	0	1		4.6				--
07/24/2012	GMW-13	18.22	12.17	6.72	-12.9	535	4.08	0	0		2.4				870
07/24/2013	GMW-13	14.07	11.14	7.84	**	860	3.94	0.5	4		0.58				2010
08/20/2014	GMW-13	19.52	10.50	5.65	**	831	1.96	0	5.02		<0.100				472
10/12/2015	GMW-13	19.57	11.40	7.18	-33.1	909	2.18	<0.1	<5		<0.100				270
07/14/2016	GMW-13	15.88	10.10	8.10	-30	1013	0.47	<0.1	2.64	7.03	0.470	2.90	3.31	515	614
07/25/2017	GMW-13	16.32	9.86	7.47	-46	1074	1.73	<0.1	3.23	9.52	0.183	3.61	3.80	561	716

TABLE 7
YEARLY FIELD AND LABORATORY WATER QUALITY PARAMETER DATA

Date	Monitoring Well ID	Groundwater Depth (ft)	Temp. (°C)	pH	Redox (mV)	Conductivity (mS/cm)	DO (mg/L)	Nitrate (mg/L)	Sulfate (mg/L)	Fe^{3+} (mg/L)	Fe^{2+} (mg/L)	Mn^{2+} (mg/L)	Total Mn (mg/L)	Alkalinity as $CaCO_3$ (mg/L)	Methane (µg/L)
06/29/2009	GMW-21	45.66	10.75	7.12	-200	545	1.81	0	56		3.1				<26
09/17/2009	GMW-21	44.70	12.54	6.99	-186.5	549	1.33	11.7	61		3				--
11/06/2009	GMW-21	44.61	13.25	6.87	-173	577	1.92	10.3	70		3				--
05/10/2010	GMW-21	43.32	9.48	7.66	8.1	933	1.75	0	70		0.98				--
06/24/2010	GMW-21	43.00	9.67	7.14	69.3	898	4.9	4.9	700		2.12				--
10/20/2010	GMW-21	39.92	9.61	7	26.4	835	2.12	2.19	670		0.37				--
06/02/2011	GMW-21	41.26	9.96	7.25	43.6	686	10.65	0	67		2.11				--
07/24/2012	GMW-21	45.55	11.28	7.01	-275	794	6.95	0	55		2.54				130
07/24/2013	GMW-21	47.11	10.60	7.78	**	779	3.23	0	42		1.75				92.9
08/20/2014	GMW-21	47.68	11.85	6.46	**	743	0.69	0	24.9		<0.100				33.1
10/12/2015	GMW-21	47.19	9.84	7.52	-92.5	876	1.77	<0.1	22.5		0.187				136
07/14/2016	GMW-21	42.71	9.85	7.85	165	879	6.12	8.65	114	9.56	<0.1	0.629	2.17	304	84
07/25/2017	GMW-21	42.67	9.67	7.39	152	1070	4.02	4.84	117	5.25	<0.1	1.09	1.29	361	25
06/29/2009	GMW-25	38.50	10.16	6.78	83.7	551	10.98	0.9	70		0.08				<26
09/17/2009	GMW-25	37.51	12.47	6.72	62.9	562	8.74	14.6	49		2.4				--
11/06/2009	GMW-25	37.66	12.86	6.66	42	554	9	15.5	36		3				--
05/10/2010	GMW-25	36.36	9.40	8.05	30.5	868	9.05	0	68		1.02				--
06/24/2010	GMW-25	36.02	9.73	7.19	83	805	8.58	4	700		0.97				--
10/20/2010	GMW-25	32.75	10.08	6.9	29.5	836	7.52	0	440		0.37				--
06/02/2011	GMW-25	34.51	9.92	7.28	38.8	839	14.6	0	140		0.37				--
07/24/2012	GMW-25	38.41	11.12	6.95	242	649	8.73	0	700		1.06				1.9
07/24/2013	GMW-25	40.05	11.43	8.32	**	809	3.86	0	700		0.57				<5
08/20/2014	GMW-25	40.52	11.05	6.88	**	923	2.45	17.7	113		<0.100				<5
10/12/2015	GMW-25	40.12	9.93	7.33	31	966	2.44	17.4	96.3		<0.100				0.945
07/14/2016	GMW-25	35.97	10.47	7.78	210	892	5.20	17.7	63.3	0.598	<0.100	0.0496	0.334	273	<5
07/25/2017	GMW-25	35.83	10.14	7.47	152	919	11.7	27.4	84	2.63	<0.100	0.0599	1.54	330	2.18
06/29/2009	GMW-30	31.86	10.63	6.92	138	454	9.13	1.9	27		1.64				<26
09/17/2009	GMW-30	30.86	12.52	6.57	95.2	467	9.07	0	23		0.23				--
11/06/2009	GMW-30	31.06	12.90	6.25	52.3	475	8.4	0	15		0.52				--
05/10/2010	GMW-30	29.74	9.72	7.78	35.7	946	3.13	3.6	53		0.17				--
06/24/2010	GMW-30	29.42	9.53	7.16	101.8	905	7.77	4.8	157		0				--
10/20/2010	GMW-30	26.09	10.23	7.3	27.3	854	9.1	0	35		0.28				--
06/02/2011	GMW-30	27.87	9.88	7.45	50	731	11.58	0	26		0.46				--
07/24/2012	GMW-30	31.79	11.08	6.99	230	452	2.51	0	13		1.65				130
07/24/2013	GMW-30	33.41	10.89	8.24	**	554	3.99	0	10		1.08				69.6
08/20/2014	GMW-30	33.87	10.41	6.91	**	597	3.26	0.954	8.71		<0.100				13.9
10/12/2015	GMW-30	33.34	9.95	7.63	-51.9	722	2.51	0.131	18.1		<0.100				47.5
07/14/2016	GMW-30	29.19	10.57	8.11	197	810	5.17	5.47	18.2	1.06	<0.100	0.344	2.69	361	177
07/25/2017	GMW-30	29.08	9.64	7.22	161	860	7.93	3.17	13.1	1.96	<0.100	0.279	4.29	376	91.3

TABLE 7
YEARLY FIELD AND LABORATORY WATER QUALITY PARAMETER DATA

Date	Monitoring Well ID	Groundwater Depth (ft)	Temp. (°C)	pH	Redox (mV)	Conductivity (mS/cm)	DO (mg/L)	Nitrate (mg/L)	Sulfate (mg/L)	Fe^{3+} (mg/L)	Fe^{2+} (mg/L)	Mn^{2+} (mg/L)	Total Mn (mg/L)	Alkalinity as $CaCO_3$ (mg/L)	Methane (µg/L)
8/20/2014	GMW-35	30.49	12.02	7.35	280	887	1.68	9.53	133		<0.100				<5
10/12/2015	GMW-35	30.2	10.38	7.48	76.4	848	3.07	6.48	64		<0.100				1.02
07/14/2016	GMW-35	27.28	10.01	8.05	150	696	~~11.14~~	4.51	27	1.28	<0.100	<0.0100	1.83	335	<5
07/25/2017	GMW-35	27.45	9.68	6.89	181	714	~~12.88~~	5.22	32.5	2.53	<0.100	<0.0100	0.871	361	<0.585
06/29/2009	MW-1	12.11	8.71	7.19	-49.5	652	7.5	0	70		0				<26
09/17/2009	MW-1	12.85	16.10	7.02	-45.8	612	10.1	1.1	70		0				--
11/06/2009	MW-1	12.38	18.30	6.85	-42	652	8.76	1.9	70		0.06				--
05/10/2010	MW-1	11.42	7.84	7.62	22.2	821	6	0.3	350		0.26				--
06/24/2010	MW-1	11.10	8.30	6.3	74.9	905	8.8	5.2	706		0.07				--
10/20/2010	MW-1	10.21	11.73	7.5	0.6	888	4.81	2.3	730		0				--
06/02/2011	MW-1	9.6	7.70	7.75	39.9	527	17.25	0.6	700		0.05				--
07/24/2012	MW-1	13.52	11.58	6.94	250	553	10.03	0.8	700		0.29				<0.58
07/24/2013	MW-1	14.38	9.90	8.12	**	814	4.1	0.5	700		0.36				<5
08/20/2014	MW-1	14.72	10.61	6.8	**	812	1.41	27.6	64.1		<0.100				<5
10/12/2015	MW-1	14.81	10.80	7.09	-2	1000	6.12	28.6	104		<0.100				<0.5
07/14/2016	MW-1	11.77	9.24	8.2	127	866	6.1	22.7	62.3	0.211	<0.100	<0.0100	0.0122	252	<3
07/25/2017	MW-1	12.12	9.30	6.98	10.5	887	6.0	16.3	50.5	<0.100	<0.100	<0.0100	<0.0100	314	<0.58
06/29/2009	MW-5	40.89	9.85	7.05	-12.7	523	7.75	0.4	43		0.03				<26
09/17/2009	MW-5	40.55	12.82	6.97	-27.1	551	9.13	0.8	49		0				--
11/06/2009	MW-5	39.99	14.05	6.89	-27	592	8.8	0.5	35		0				--
05/10/2010	MW-5	38.37	9.58	7.74	22.4	908	7.07	0.9	112		0.17				--
06/24/2010	MW-5	38.05	9.85	7.02	99	842	9.82	2	71		0				--
10/20/2010	MW-5	35.20	9.41	7.3	8.2	800	7.39	1.1	51		0.06				--
06/02/2011	MW-5	36.61	9.68	7.51	56.6	639	16.63	0.4	700		0.08				-
07/24/2012	MW-5	40.88	11.39	7.03	-85.3	480	8.31	0.9	26		0.05				<0.58
07/24/2013	MW-5	42.33	10.34	8.06	**	772	4.43	0.8	25		0.01				<5
08/20/2014	MW-5	42.87	10.48	6.95	**	753	1.67	7.76	23		<0.100				<5
10/12/2015	MW-5	42.39	9.87	7.37	11.8	800	5.5	7.3	33		<0.100				<0.5
07/14/2016	MW-5	37.94	9.72	8.34	187	787	4.81	6.76	33.3	0.203	<0.100	<0.0100	0.0043	371	<5
07/25/2017	MW-5	37.96	9.74	7.45	91	748	~~11.16~~	8.72	26	1.24	<0.100	<0.0100	0.17	402	<0.5

TABLE 8 – SUMMARY FIELD WATER QUALITY PARAMETER DATA VOGEL PAINT WASTE SITE GEOTEK #91-400								
Monitoring Well ID	**Date**	**Water Level (ft below TOR)**	**Temperature (°C)**	**Conductivity (µS/cm)**	**Total Dissolved Solids (mg/L)**	**Dissolved Oxygen (mg/L)**	**pH**	**ORP (mV)**
BACKGROUND/PERIMETER/OUTSIDE CONTAMINANT PLUME								
GMW1	07/25/2017	7.00	11.88	1147	745	1.43	7.46	108
GMW1	07/10/2018	5.18	14.36	1222	794	1.76	7.21	78.4
TC-10	07/14/2016	5.78	16.88	589	383	0.97	7.52	186
TC-10	07/25/2017	6.55	15.34	847	550	4.43	7.14	116
TC-10	07/10/2018	4.85	16.27	944	614	3.60	7.57	71.2
GMW3	01/28/2016	15.88	10.08	725	472	8.93	7.1	41
GMW3	04/16/2016	14.32	7.52	766	498	~~10.14~~	6.91	169
GMW3	07/14/2016	13.59	10.81	707	459	7.65	7.65	175
GMW3	12/28/2016	13.59	11.44	709	461	~~10.25~~	7.57	99.4
GMW3	07/25/2017	14.11	10.44	733	477	~~11.93~~	7.04	136
GMW3	11/30/2017	14.50	12.12	744	484	8.47	7.05	108
GMW3	07/10/2018	11.65	9.27	671	436	~~13.00~~	7.47	77
GMW4	01/28/2016	8.12	6.55	1108	721	9.56	7.12	7
GMW4	07/14/2016	6.64	14.15	533	348	5.78	7.78	166
GMW4	12/28/2016	6.45	7.14	627	407	7.62	7.40	88.7
GMW4	07/24/2017	7.12	16.18	468	304	6.24	7.12	120
GMW4	11/30/2017	7.27	9.48	545	354	7.93	7.01	138
GMW4	07/10/2018	5.26	17.33	468	304	9.10	7.47	71.0
TC-7	01/28/2016	7.01	6.18	909	591	2.01	7.05	20
TC-7	04/12/2016	5.79	6.20	769	500	1.03	6.91	175
TC-7	12/28/2016	5.66	7.01	748	486	2.45	7.22	107
TC-7	07/24/2017	6.38	14.07	617	401	1.75	7.28	98
TC-7	11/30/2017	6.49	9.62	716	466	5.45	7.02	128
TC-7	07/10/2018	4.58	15.92	910	591	2.23	7.35	75.1
MW1	06/29/2009	12.11	8.71	652	---	7.5	7.19	-49.5
MW1	09/17/2009	12.85	16.10	612	---	10.1	7.02	-45.8
MW1	11/06/2009	12.38	18.30	652	---	8.76	6.85	-42
MW1	05/10/2010	11.42	7.84	821	---	6	7.62	22.2
MW1	06/24/2010	11.10	8.30	905	---	8.8	6.3	74.9
MW1	10/20/2010	10.21	11.73	888	---	4.81	7.5	0.6
MW1	06/02/2011	9.6	7.70	527	---	~~17.25~~	7.75	39.9
MW1	07/24/2012	13.52	11.58	553	---	10.03	6.94	250
MW1	07/24/2013	14.38	9.90	814	---	7.1	8.12	---
MW1	8/20/2014	14.72	10.61	812	---	1.41	6.8	---
MW1	10/12/2015	14.81	10.80	1000	---	6.12	7.09	-2
MW1	01/28/2016	13.66	9.67	959	624	6.64	7.12	-35
MW1	04/12/2016	12.21	8.74	972	632	6.54	7.06	159
MW1	07/14/2016	11.77	9.24	866	563	6.1	8.2	127
MW1	12/28/2016	11.61	10.26	921	599	7.82	7.25	94.4
MW1	07/24/2017	12.12	9.30	887	576	5.73	6.98	105
MW1	11/30/2017	12.36	11.06	998	649	6.50	6.99	149
MW1	07/10/2018	10.01	9.20	927	602	~~14.31~~	6.85	88.4
GMW8	01/28/2016	35.02	9.47	824	536	4.7	7.06	-57
GMW8	04/12/2016	33.52	10.50	897	583	6.07	7.33	69
GMW8	07/14/2016	31.97	10.67	600	390	~~10.26~~	7.77	105
GMW8	12/28/2016	32.28	10.26	888	578	7.75	7.59	41.2
GMW8	07/25/2017	32.05	10.54	566	367	8.55	7.06	86
GMW8	11/30/2017	32.98	10.49	1025	667	7.52	6.87	123

TABLE 8 – SUMMARY FIELD WATER QUALITY PARAMETER DATA VOGEL PAINT WASTE SITE GEOTEK #91-400								
Monitoring Well ID	Date	Water Level (ft below TOR)	Temperature (°C)	Conductivity (µS/cm)	Total Dissolved Solids (mg/L)	Dissolved Oxygen (mg/L)	pH	ORP (mV)
GMW8	07/10/2018	30.31	10.40	1035	673	~~11.64~~	7.22	84.2
GMW6	01/28/2016	38.67	9.4	850	551	6.71	6.92	183
GMW6	04/12/2016	37.32	10.17	872	567	4.14	7.50	22
GMW6	12/28/2016	35.68	9.57	908	5.9	5.95	7.54	65
GMW6	07/24/2017	35.01	9.90	883	574	7.95	7.39	96
GMW6	11/30/2017	36.29	9.80	903	587	6.08	6.95	120
TC-22D	12/02/2015	35.41	8.72	958	---	2.32	8	-67.5
TC-22D	01/28/2016	34.13	9.37	888	576	0.84	7.75	-244
TC-22D	04/12/2016	32.67	9.75	1158	752	0.37	8.06	-210
TC-22D	12/28/2016	31.49	9.71	613	398	0.92	7.33	31.4
TC-22D	07/24/2017	30.99	9.80	714	464	2.45	9.58	-200
TC-22D	11/30/2017	32.15	9.93	720	467	5.19	8.40	37
MW5	06/29/2009	40.89	9.85	523	---	7.75	7.05	-12.7
MW5	09/17/2009	40.55	12.82	551	---	9.13	6.97	-27.1
MW5	11/06/2009	39.99	14.05	592	---	8.8	6.89	-27
MW5	05/10/2010	38.37	9.58	908	---	7.07	7.74	22.4
MW5	06/24/2010	38.05	9.85	842	---	9.82	7.02	99
MW5	10/20/2010	35.20	9.41	800	---	7.39	7.3	8.2
MW5	06/02/2011	36.61	9.68	639	---	~~16.63~~	7.51	56.6
MW5	07/24/2012	40.88	11.39	480	---	8.31	7.03	-85.3
MW5	07/24/2013	42.33	10.34	772	---	4.43	8.06	---
MW5	8/20/2014	42.87	10.48	753	---	1.67	6.95	---
MW5	10/12/2015	42.39	9.87	800	---	5.5	7.37	11.8
MW5	01/28/2016	41.73	9.38	766	499	7.41	7.05	99
MW5	02/11/2016	41.68	9.17	761	494	6.35	7.14	105.4
MW5	04/12/2016	40.54	9.55	794	516	5.64	7.11	137
MW5	07/14/2016	37.94	9.72	787	511	4.81	8.34	187
MW5	12/28/2016	38.69	9.53	743	483	7.18	7.83	186
MW5	07/24/2017	37.96	9.74	748	486	11.16	7.23	103
MW5	11/30/2017	39.30	9.66	781	508	9.50	7.03	128
MW5	04/05/2018	40.03	9.80	753	490	10.79	5.65	130
MW5	07/10/2018	37.30	9.87	816	530	~~12.32~~	6.87	113.1
GMW40	02/11/2016	31.41	9.13	807	524	3.92	6.83	-28.3
GMW40	04/12/2016	30.43	9.68	822	534	0.85	6.93	174
GMW40	12/28/2016	27.57	10.13	833	541	5.95	7.25	215
GMW40	04/13/2017	28.05	10.51	883	574	7.44	7.12	130
GMW40	11/30/2017	29.26	10.03	897	583	6.90	7.00	86
GMW40	04/05/2018	29.85	10.13	862	560	8.22	5.60	105
GMW44	04/12/2016	34.03	9.52	862	560	8.33	6.92	181
GMW44	12/28/2016	32.00	9.8	540	350	6.58	8.05	168
GMW44	04/13/2017	32.45	10.75	960	624	7.43	6.98	143
GMW44	11/30/2017	34.21	9.80	871	566	8.45	7.03	111
GMW44	04/05/2018	34.79	9.86	866	563	9.82	5.72	119
SOURCE AREAS								
GMW13	06/29/2009	18.14	9.47	668	---	1.09	7.03	-83
GMW13	09/17/2009	18.47	11.37	622	---	0.81	6.91	-98.5
GMW13	11/06/2009	16.70	12.93	566	---	1.04	6.79	-114
GMW13	05/10/2010	15.97	8.78	1091	---	1.72	7.3	7.48
GMW13	06/24/2010	15.65	9.34	1113	---	2.25	6.82	63.7

TABLE 8 – SUMMARY FIELD WATER QUALITY PARAMETER DATA VOGEL PAINT WASTE SITE GEOTEK #91-400

Monitoring Well ID	Date	Water Level (ft below TOR)	Temperature (°C)	Conductivity (µS/cm)	Total Dissolved Solids (mg/L)	Dissolved Oxygen (mg/L)	pH	ORP (mV)
GMW13	10/20/2010	14.19	11.95	1050	---	1.58	7.3	-18.1
GMW13	06/02/2011	13.78	9.11	683	---	6.51	7.48	10.5
GMW13	07/24/2012	18.22	12.17	535	---	4.08	6.72	-12.9
GMW13	07/24/2013	14.07	11.14	860	---	3.94	7.84	---
GMW13	08/20/2014	19.52	10.5	831	---	1.96	5.65	---
GMW13	10/12/2015	19.57	11.4	909	---	2.18	7.18	-33
GMW13	12/03/2015	18.95	10.7	937	---	4.4	6.96	-18.7
GMW13	01/28/2016	18.31	10.5	922	599	0.91	6.98	-40
GMW13	04/12/2016	16.74	8.93	924	601	0.47	7.01	-1
GMW13	07/14/2016	15.88	10.1	1013	658	0.47	8.1	-30
GMW13	12/28/2016	16.02	10.65	944	614	0.57	7.16	-46.8
GMW13	07/25/2017	16.32	9.86	1074	698	1.73	7.47	-43
GMW13	11/30/2017	16.82	11.38	987	641	1.05	6.88	-33
GMW13	07/10/2018	14.10	9.44	846	550	1.6	7.41	13.1
GMW14	01/28/2016	17.61	10.25	1113	725	1.64	6.88	-4
GMW14	04/12/2016	16.01	8.40	1076	699	0.63	6.90	22
GMW14	07/14/2016	14.99	10.92	1089	707	0.5	7.58	58
GMW14	07/25/2017	15.34						
GMW14	11/30/2017	16.02						
GMW14	07/10/2018	13.11						
GMW9R	06/29/2009	24.03	10.82	618	---	1.31	7.14	-167
GMW9R	09/17/2009	24.61	12.63	603	---	1.11	7.01	-152
GMW9R	11/06/2009	22.03	12.97	579	---	1.15	6.81	-136.9
GMW9R	05/10/2010	21.29	9.92	1127	---	1.89	7.42	-11.1
GMW9R	06/24/2010	20.97	9.62	848	---	1.93	7.07	45
GMW9R	10/20/2010	18.77	10.79	905	---	1.94	7.4	-19.8
GMW9R	06/02/2011	19.19	9.95	543	---	~~14.09~~	7.77	59
GMW9R	07/24/2012	23.88	11.29	522	---	3.31	6.93	-102
GMW9R	07/24/2013	25.13	13.53	1110	---	4.25	7.89	---
GMW9R	08/20/2014	25.61	11.60	881	---	0.71	6.02	---
GMW9R	10/12/2015	25.48	10.70	864	---	1.4	7.40	-128.7
GMW9R	12/03/2015	25.17	9.95	993	---	3.21	7.23	-77.4
GMW9R	01/28/2016	24.41	10.69	1902	1043	1.35	6.77	-11
GMW9R	04/12/2016	22.85	9.29	1278	831	3.21	6.97	124
GMW9R	05/05/2016	21.67	9.49	867	563	1	6.98	75
GMW9R	07/14/2016	21.33	10.49	1143	743	0.50	7.58	17.5
GMW9R	12/28/2016	21.64	10.57	1447	941	2.06	7.05	24.1
GMW9R	07/25/2017	21.42	9.58	1249	810	2.75	7.16	-18
GMW9R	11/30/2017	22.35	11.01	959	623	1.93	6.84	-42
GMW9R	04/05/2018	22.39	9.43	1300	846	2.03	5.40	-2
GMW9R	07/10/2018	19.42	8.68	1240	806	2.47	7.03	71.8
GMW11	01/28/2016	27.45	10.2	795	517	9.91	7.24	-70
GMW11	04/12/2016	25.97	10.55	819	532	1.52	7.52	-13
GMW11	07/14/2016	24.20	10.03	812	528	1.47	7.89	17
GMW11	12/28/2016	24.75	10.57	772	502	2.71	7.83	2.7
GMW11	07/25/2017	24.26	10.02	790	513	3.15	7.02	43
GMW11	11/30/2017	25.38	10.57	798	519	2.83	7.07	95.7
GMW11	07/10/2018	22.98	9.78	835	542	1.81	7.33	62.3

TABLE 8 – SUMMARY FIELD WATER QUALITY PARAMETER DATA VOGEL PAINT WASTE SITE GEOTEK #91-400

Monitoring Well ID	Date	Water Level (ft below TOR)	Temperature (°C)	Conductivity (µS/cm)	Total Dissolved Solids (mg/L)	Dissolved Oxygen (mg/L)	pH	ORP (mV)
TC-6D	12/02/2015	33.33	9.04	687	---	3.76	7.48	-104.8
TC-6D	01/28/2016	32.61	9.63	666	434	0.43	7.32	-119
TC-6D	04/12/2016	31.18	9.83	671	436	0.52	7.73	-109
TC-6D	05/05/2016	30.65	9.98	647	439	0.39	7.43	-79
TC-6D	12/28/2016	30.00	9.82	634	412	0.67	7.78	-102.4
TC-6D	07/24/2017	29.16	9.78	696	452	3.04	8.25	-84
TC-6D	11/30/2017	30.72	10.22	552	359	3.41	7.0	18.2
TC-6D	04/05/2018	31.03	10.23	678	441	3.75	5.69	-40
TC-6D	07/10/2018	28.55	9.72	790	514	1.19	7.94	-38.7
DOWNGRADIENT OF SOURCE AREAS								
TC-17D	04/12/2016	30.27	9.71	168	110	0.80	8.48	-168
TC-17D	07/14/2016	28.51	9.67	226	147	0.46	8.86	-183
TC-17D	12/28/2016	29.04	9.81	202	131	0.65	8.21	44.5
TC-17D	07/24/2017	28.49	9.78	413	269	3.30	8.90	19.1
TC-17D	11/30/2017	29.68	9.99	418	271	3.38	8.40	60
TC-17D	07/10/2018	27.26	9.56	458	297	1.40	10.22	-251
GMW10R	12/02/2015	26.1	9.40	900	---	3.24	7	-2
GMW10R	01/28/2016	25.36	10.29	975	635	4.17	7.03	6
GMW10R	04/12/2016	23.61	9.42	720	468	6.94	7.28	101
GMW10R	05/05/2016	22.38	9.47	712	463	4.75	7.07	84
GMW10R	07/14/2016	22.18	10.08	845	549	7.35	7.46	123
GMW10R	12/28/2016	22.69	10.62	795	517	7.45	7.45	52.5
GMW10R	07/24/2017	22.62	9.23	891	579	11.40	6.90	120
GMW10R	11/30/2017	23.41	10.58	897	583	8.28	6.70	87.4
GMW10R	04/05/2018	23.48	9.48	613	398	7.40	5.49	65
GMW10R	07/10/2018	20.37	9.16	806	523	9	7.32	63.6
TC-23	01/28/2016	47.66	9.42	430	274	0.9	8.4	-270
TC-23	02/11/2016	47.59	9.29	415	270	1	8.47	-257.8
TC-23	04/12/2016	46.31	9.53	441	297	0.59	8.43	-225
TC-23	07/14/2016	44.03	9.79	286	187	0.44	8.28	159
TC-23	12/28/2016	44.59	9.19	639	415	1.05	7.44	-10.8
TC-23	07/24/2017	43.89	9.76	306	198	1.57	8.30	91.0
TC-23	11/30/2017	45.20	9.60	276	179	4.03	9.03	85
TC-23	07/10/2018	43.09	10.00	352	229	1.72	8.03	85.2
GMW15	12/02/2015	39.94	9.02	888	---	3.74	7.81	-117.7
GMW15	01/28/2016	39.25	9.29	740	481	0.65	7.44	-108
GMW15	04/12/2016	37.89	9.90	784	509	0.48	7.66	-56
GMW15	05/05/2016	37.28	9.87	807	525	0.33	7.24	72
GMW15	12/28/2016	36.27	9.58	808	525	0.54	7.4	22.9
GMW15	07/24/2017	35.57	9.78	848	551	4.08	7.44	118
GMW15	11/30/2017	36.87	9.67	836	543	0.74	7.19	-25
GMW15	04/05/2018	37.28	9.95	782	508	1.50	5.75	-74
GMW16	01/28/2016	38.21	9.35	823	536	0.78	7.39	-94
GMW16	04/12/2016	36.81	9.73	847	550	1.06	7.54	-34
GMW16	12/28/2016	35.23	9.27	840	546	0.85	7.36	4.9
GMW16	07/24/2017	34.56	9.75	833	541	2.0	8.07	-110
GMW16	11/30/2017	35.83	9.64	844	548	0.87	7.10	-3.8
GMW17	01/28/2016	42.57	9.32	918	598	1.1	7.31	-57
GMW17	04/12/2016	41.25	9.69	1002	651	0.47	7.39	45

TABLE 8 – SUMMARY FIELD WATER QUALITY PARAMETER DATA VOGEL PAINT WASTE SITE GEOTEK #91-400

Monitoring Well ID	Date	Water Level (ft below TOR)	Temperature (°C)	Conductivity (µS/cm)	Total Dissolved Solids (mg/L)	Dissolved Oxygen (mg/L)	pH	ORP (mV)
GMW17	12/28/2016	39.55	9.09	926	603	1.25	7.37	81.3
GMW17	07/24/2017	38.86	9.70	1007	655	10.55	7.37	125
GMW17	11/30/2017	40.16	9.62	1081	703	3.03	7.11	115
GMW18R	01/28/2016	45.61	9.31	822	535	5.77	7.67	-36
GMW18R	04/12/2016	43.69	9.62	850	553	2.05	7.33	89
GMW18R	12/28/2016	42.00	9.4	886	576	2.87	7.2	81.4
GMW18R	07/24/2017	41.34	9.83	938	609	1.45	7.26	124
GMW18R	11/30/2017	42.63	9.60	885	575	2.81	7.21	116
GMW34	01/28/2016	35.98	9.39	1593	1036	7.65	7.07	159
GMW34	04/12/2016	34.62	10.01	1329	864	5.37	7.35	71
GMW34	12/28/2016	32.78	9.04	826	537	9.45	7.36	76
GMW34	07/24/2017	32.30	9.89	860	559	9.75	7.11	123
GMW34	11/30/2017	33.59	10.13	914	594	9.22	7.04	107
GMW34	04/05/2018	34.06	9.99	853	554	10.70	5.82	65
GMW7R	06/29/2009	40.96	10.25	530	---	1.06	7.3	-192
GMW7R	09/17/2009	40.02	12.84	542	---	1.01	7.07	-178
GMW7R	11/06/2009	39.71	13.01	565	---	1.84	6.84	-164.5
GMW7R	05/10/2010	38.61	9.50	898	---	1.58	7.64	2.2
GMW7R	06/24/2010	38.29	9.48	833	---	1.78	6.73	80.3
GMW7R	10/20/2010	35.29	9.37	783	---	2.1	8.0	-26.9
GMW7R	06/02/2011	36.59	9.91	673	---	6.29	7.61	50.1
GMW7R	07/24/2012	40.90	10.61	474	---	3.1	6.8	-142
GMW7R	07/24/2013	42.38	10.70	776	---	3.7	7.7	---
GMW7R	08/20/2014	42.92	12.14	335	---	1.45	6.87	---
GMW7R	10/12/2015	42.52	9.78	800	---	1.7	7.52	-97.6
GMW7R	12/03/2015	42.48	9.21	773	---	2.2	7.54	-79.3
GMW7R	01/28/2016	41.82	9.27	790	514	1.71	7.17	-24
GMW7R	02/11/2016	41.74	8.85	779	506	1.73	7.45	-94
GMW7R	04/12/2016	40.58	9.40	833	542	0.97	7.19	71
GMW7R	05/05/2016	40.02	9.98	846	550	0.58	7.47	49
GMW7R	07/14/2016	38.12	9.83	917	531	0.61	8	46
GMW7R	12/28/2016	38.74	9.42	793	516	0.57	7.6	-98.1
GMW7R	07/24/2017	38.03	9.89	799	519	6.51	7.09	62
GMW7R	11/30/2017	39.37	9.49	830	539	1.32	7.16	23.8
GMW7R	04/05/2018	39.83	9.62	837	544	1.25	5.68	4
GMW7R	07/10/2018	37.32	9.88	933	607	1.43	6.80	99.8
GMW19	12/02/2015	42.48	9.12	871	---	2.61	7.41	-16.6
GMW19	01/28/2016	41.82	9.24	857	552	2.88	7.11	115
GMW19	02/11/2016	41.77	8.69	854	550	2.07	7.31	-35
GMW19	04/12/2016	40.58	9.41	871	566	1.01	7.14	66
GMW19	05/05/2016	40.04	10.06	868	564	0.52	7.48	0.5
GMW19	07/14/2016	38.06	10.17	856	557	0.55	7.84	145
GMW19	12/28/2016	38.75	9.49	833	542	0.8	7.73	135
GMW19	07/24/2017	38.00	9.76	832	541	1.39	7.09	100
GMW19	11/30/2017	39.37	9.60	860	559	2.00	7.04	124
GMW19	04/05/2018	39.84	9.79	799	519	1.90	5.40	72
GMW19	07/10/2018	37.30	9.96	809	526	1.32	7.12	100.0
GMW20	12/02/2015	44.47	9.33	1208	---	4.7	7.23	15.7
GMW20	01/28/2016	43.70	9.2	1153	750	5.41	7.03	73

TABLE 8 – SUMMARY FIELD WATER QUALITY PARAMETER DATA VOGEL PAINT WASTE SITE GEOTEK #91-400								
Monitoring Well ID	Date	Water Level (ft below TOR)	Temperature (°C)	Conductivity (µS/cm)	Total Dissolved Solids (mg/L)	Dissolved Oxygen (mg/L)	pH	ORP (mV)
GMW20	02/11/2016	43.62	8.97	1079	701	3.68	7.55	-30
GMW20	04/12/2016	42.41	9.73	1185	770	4.60	7.27	129
GMW20	05/05/2016	41.98	9.62	959	624	8.2	7.28	35
GMW20	07/14/2016	40.04	10.59	973	633	5.73	7.97	181
GMW20	12/28/2016	40.75	9.07	964	627	4.24	7.38	-3.1
GMW20	07/24/2017	40.01	9.84	993	645	6.46	7.23	110
GMW20	11/30/2017	41.36	9.57	1071	696	5.05	7.10	107
GMW20	04/05/2018	41.78	9.69	1069	694	5.50	5.68	86
GMW20	07/10/2018	39.27	9.80	1101	715	~~12.95~~	6.82	111.9
GMW33	12/02/2015	46.45	9.18	1071	---	1.9	8.04	-170
GMW33	01/28/2016	45.70	9.38	950	618	0.94	7.22	-97
GMW33	02/11/2016	45.62	8.92	910	592	1	8	-113.8
GMW33	04/12/2016	44.41	9.58	939	610	0.55	8.03	-145
GMW33	05/05/2016	43.92	9.59	888	577	0.36	7.4	-96
GMW33	07/14/2016	42.01	9.89	1070	695	0.45	7.71	185
GMW33	12/28/2016	42.61	9.46	915	594	0.48	7.56	12
GMW33	07/24/2017	41.93	9.61	937	609	1.04	7.31	115
GMW33	11/30/2017	43.28	9.60	1123	730	1.05	7.12	110
GMW33	04/05/2018	43.75	9.70	1265	822	1.38	5.65	86
GMW33	07/10/2018	41.13	9.82	958	623	1.13	6.87	112.5
GMW21	06/29/2009	45.66	10.72	545	----	1.81	7.12	-200
GMW21	09/17/2009	44.70	12.54	549	---	1.33	6.99	-186.5
GMW21	11/06/2009	44.61	13.25	577	---	1.92	6.87	-173
GMW21	05/10/2010	43.32	9.48	933	---	1.75	7.66	8.1
GMW21	06/24/2010	43.00	9.67	898	---	4.9	7.14	69.3
GMW21	10/20/2010	39.92	9.61	835	----	2.12	7.0	26.4
GMW21	06/02/2011	41.26	9.96	686	---	~~10.65~~	7.25	43.6
GMW21	07/24/2012	45.55	11.28	794	---	6.95	7.01	-275
GMW21	07/24/2013	47.11	10.60	779	---	3.23	7.78	----
GMW21	08/20/2014	47.68	11.85	743	---	0.69	6.46	----
GMW21	10/12/2015	47.19	9.84	876	----	1.77	7.52	-92.5
GMW21	12/03/2015	47.19	9.04	862	---	2.2	7.65	-81.5
GMW21	01/28/2016	46.58	9.32	979	637	0.5	7.08	-5
GMW21	02/11/2016	46.48	9.02	974	633	1	7.20	0
GMW21	04/12/2016	45.33	9.46	931	605	0.68	7.31	40
GMW21	05/05/2016	44.82	9.93	913	593	6.4	7.8	-13
GMW21	07/14/2016	42.71	9.85	879	571	6.12	7.85	165
GMW21	12/28/2016	43.40	9.37	874	568	1.7	7.56	18.8
GMW21	04/13/2017	43.76	9.83	1015	659	6.85	7.00	152
GMW21	07/24/2017	42.67	9.67	1070	659	4.02	7.21	144
GMW21	11/30/2017	44.02	9.53	1034	672	2.23	7.23	78
GMW21	04/05/2018	44.50	9.58	984	640	1.42	5.71	23
GMW22	01/28/2016	44.98	9.32	725	471	0.5	7.27	-83
GMW22	02/11/2016	44.89	8.89	731	475	1.92	7.40	-77.5
GMW22	04/12/2016	43.77	9.46	742	483	0.71	7.34	-65
GMW22	12/28/2016	41.83	9.39	691	449	0.59	7.73	-52.1
GMW22	04/13/2017	42.18	9.75	741	482	0.54	7.30	-39.2
GMW22	07/24/2017	41.07	9.73	684	444	1.00	7.90	-62
GMW22	11/30/2017	42.44	9.55	709	461	1.28	7.06	-34

TABLE 8 – SUMMARY FIELD WATER QUALITY PARAMETER DATA VOGEL PAINT WASTE SITE GEOTEK #91-400

Monitoring Well ID	Date	Water Level (ft below TOR)	Temperature (°C)	Conductivity (µS/cm)	Total Dissolved Solids (mg/L)	Dissolved Oxygen (mg/L)	pH	ORP (mV)
GMW22	04/05/2018	42.93	9.59	680	442	1.70	5.81	-53
LEADING EDGE OF CONTAMINANT PLUMES								
GMW25	06/29/2009	38.50	10.16	551	---	~~10.98~~	6.78	83.7
GMW25	09/17/2009	37.51	12.47	562	---	8.74	6.72	62.9
GMW25	11/06/2009	37.66	12.86	554	---	9	6.66	42
GMW25	05/10/2010	36.36	9.40	868	---	9.05	8.05	30.5
GMW25	06/24/2010	36.02	9.73	805	---	5.58	7.19	83
GMW25	10/20/2010	32.75	10.08	836	---	7.52	6.9	29.5
GMW25	06/02/2011	34.51	9.92	839	---	~~14.6~~	7.28	38.8
GMW25	07/24/2012	38.41	11.12	649	---	8.73	6.95	242
GMW25	07/24/2013	40.05	11.43	809	---	3.86	8.32	---
GMW25	08/20/2014	40.52	11.05	923	---	2.45	6.88	---
GMW25	10/12/2015	40.12	9.93	966	---	2.44	7.33	31
GMW25	01/28/2016	39.73	9.33	849	552	8.85	7.31	155
GMW25	02/11/2016	39.67	9.11	833	542	9.33	7.45	146
GMW25	04/12/2016	38.70	9.58	953	619	0.78	7.08	144
GMW25	05/05/2016	38.28	9.65	952	619	2.1	7.15	100
GMW25	07/14/2016	35.97	10.47	892	580	5.2	7.78	210
GMW25	12/28/2016	36.57	9.66	757	492	2.49	7.95	154
GMW25	04/13/2017	36.96	10.06	1011	657	6.01	7.21	258
GMW25	07/24/2017	35.83	10.14	917	597	14.52	7.47	152
GMW25	11/30/2017	37.12	9.78	1031	670	7.60	7.19	124
GMW25	04/05/2018	37.71	9.85	977	635	9.75	6.20	124
GMW30	06/29/2009	31.86	10.63	454	---	9.13	6.92	138
GMW30	09/17/2009	30.86	12.52	467	---	9.07	6.57	95.2
GMW30	11/06/2009	31.06	12.90	475	---	8.4	6.25	52.3
GMW30	05/10/2010	29.74	9.72	946	---	3.13	7.78	35.7
GMW30	06/24/2010	29.42	9.53	905	---	7.77	7.16	101.8
GMW30	10/20/2010	26.09	10.23	854	---	9.1	7.3	27.3
GMW30	06/02/2011	27.87	9.88	731	---	~~11.58~~	7.45	50
GMW30	07/24/2012	31.79	11.08	452	---	2.51	6.99	230
GMW30	07/24/2013	33.41	10.89	554	---	3.99	8.24	---
GMW30	08/20/2014	33.87	10.41	597	---	3.26	6.91	---
GMW30	10/12/2015	33.34	9.95	722	---	2.51	7.63	-51.9
GMW30	12/03/2015	33.37	9.02	715	---	4.95	7.75	-3
GMW30	01/28/2016	33.00	9.6	871	566	5.01	7.38	194
GMW30	02/11/2016	32.91	9.07	822	538	4.3	7.41	134
GMW30	04/12/2016	31.98	9.75	900	585	3.89	7.15	127
GMW30	05/05/2016	31.58	9.76	1006	654	3.5	7.31	95
GMW30	07/14/2016	29.19	10.57	810	526	5.17	8.11	197
GMW30	12/28/2016	29.78	9.85	749	487	4.55	8.13	167
GMW30	04/13/2017	30.22	10.14	878	571	4.29	6.97	170
GMW30	07/24/2017	29.08	9.64	860	559	7.93	7.22	161
GMW30	11/30/2017	30.38	9.97	851	553	4.60	7.29	119
GMW30	04/05/2018	31.02	9.93	963	626	7.90	6.00	121
GMW38	02/11/2016	37.82	8.72	520	338	3.10	7.40	76.3
GMW38	04/12/2016	36.97	9.66	699	455	0.77	6.91	141
GMW38	12/28/2016	33.76	9.73	679	441	0.26	7.25	150
GMW38	04/13/2017	34.20	10.41	609	396	2.60	7.23	119

TABLE 8 – SUMMARY FIELD WATER QUALITY PARAMETER DATA VOGEL PAINT WASTE SITE GEOTEK #91-400								
Monitoring Well ID	Date	Water Level (ft below TOR)	Temperature (°C)	Conductivity (µS/cm)	Total Dissolved Solids (mg/L)	Dissolved Oxygen (mg/L)	pH	ORP (mV)
GMW38	11/30/2017	35.92	9.77	594	386	1.53	6.86	131
GMW38	04/05/2018	36.56	10.09	625	407	2.12	6.27	111
DOWNGRADIENT OF CONTAMINANT PLUMES LEADING EDGE								
GMW35	08/20/2014	30.49	12.02	887	---	1.68	7.35	---
GMW35	10/12/2015	30.2	10.38	848	---	3.07	7.48	76.4
GMW35	01/28/2016	30.06	9.92	769	500	2.99	6.58	1.8
GMW35	02/11/2016	29.83	9.44	744	484	4.91	7.16	153
GMW35	04/12/2016	29.28	10.33	770	501	2.81	7.66	125
GMW35	05/05/2016	29.09	10.23	750	487	4.74	7.11	120
GMW35	07/14/2016	27.28	10.01	696	453	~~11.14~~	8.05	150
GMW35	12/28/2016	28.01	10.14	718	467	9.9	7.77	164
GMW35	04/13/2017	28.36	10.08	752	489	8.60	7.51	224
GMW35	07/24/2017	27.45	9.68	714	464	~~12.88~~	6.89	181
GMW35	11/30/2017	28.44	9.96	714	464	9.34	6.10	191
GMW35	04/05/2018	28.88	10.06	672	437	10.76	6.48	134
GMW35	07/10/2018	27.26	9.72	755	491	~~14.60~~	6.44	129
GMW36	01/28/2016	34.81	9.65	833	542	2.58	6.26	2.05
GMW36	02/11/2016	34.74	8.68	832	541	1.4	7.13	162
GMW36	04/12/2016	33.89	9.70	842	548	1.3	6.83	157
GMW36	05/05/2016	33.49	9.91	848	551	0.72	7.25	98
GMW36	07/14/2016	31.01	9.96	796	518	6.5	7.99	156
GMW36	12/28/2016	31.70	9.66	777	505	1.6	7.37	183
GMW36	04/13/2017	32.14	9.92	897	583	2.04	7.22	196
GMW36	07/24/2017	30.97	9.65	852	554	5.27	6.81	161
GMW36	11/30/2017	32.23	9.72	892	580	2.63	6.50	153
GMW36	04/05/2018	32.92	9.95	884	575	4.20	6.07	150
GMW36	07/10/2018	31.00	9.73	940	611	5.51	6.38	129.7
GMW37	01/28/2016	42.43	9.47	1030	674	3.72	6.22	2.33
GMW37	02/11/2016	42.39	8.37	1130	674	2.38	7.07	153
GMW37	04/12/2016	41.50	9.59	1044	679	0.84	6.45	171
GMW37	05/05/2016	41.10	9.85	1044	679	0.80	7.18	92
GMW37	07/14/2016	38.63	9.71	1006	654	2.19	7.45	177
GMW37	12/28/2016	39.21	9.34	1026	667	4.20	7.21	188
GMW37	04/13/2017	39.66	9.87	1078	701	2.81	7.49	182
GMW37	07/24/2017	38.51	9.77	1020	663	8.61	7.04	159
GMW37	11/30/2017	39.77	9.65	1065	692	4.55	6.30	154
GMW37	04/05/2018	40.46	9.92	1071	696	5.96	6.16	154
GMW37	07/10/2018	38.71	9.92	1186	771	7.30	6.46	87.9
GMW39	02/11/2016	26.83	8.90	822	533	4.63	7.75	-84.2
GMW39	04/12/2016	25.41	9.80	1203	782	1.94	6.75	159
GMW39	12/28/2016	23.31	10.27	1016	660	2.32	7.41	128
GMW39	04/13/2017	23.86	10.41	1149	747	2.15	8.07	2
GMW39	11/30/2017	24.60	10.24	1397	908	1.42	6.75	10
GMW39	04/05/2018	24.99	10.10	1425	926	2.65	5.89	116
GMW41	04/12/2016	45.00	9.49	1106	719	1.80	6.86	114
GMW41	12/28/2016	43.07	9.5	1060	689	1.61	8.0	167
GMW41	04/13/2017	43.49	10.11	1129	734	7.04	7.28	86
GMW41	11/30/2017	44.91	9.63	1204	783	5.70	6.47	140
GMW41	04/05/2018	45.55	9.83	1223	795	5.45	5.65	118

TABLE 8 – SUMMARY FIELD WATER QUALITY PARAMETER DATA VOGEL PAINT WASTE SITE GEOTEK #91-400								
Monitoring Well ID	**Date**	**Water Level (ft below TOR)**	**Temperature (°C)**	**Conductivity (µS/cm)**	**Total Dissolved Solids (mg/L)**	**Dissolved Oxygen (mg/L)**	**pH**	**ORP (mV)**
GMW42	04/12/2016	26.16	9.85	1002	651	4.91	6.79	22
GMW42	12/28/2016	23.46	10.29	2609	1694	8.77	7.35	21.4
GMW42	04/13/2017	23.38	10.27	1284	835	8.62	7.27	132
GMW42	11/30/2017	25.41	10.40	1189	773	7.70	6.54	201
GMW42	04/05/2018	26.02	10.15	1112	723	6.78	6.20	137

TABLE 9
Comparison of ARAR/TBC Groundwater Standards
Vogel Paint and Wax Company Superfund Site
Sioux County, Iowa

Chemical of Concern	Consent Order SWS, µg/L	Current SWS, µg/L	Current MCL, µg/L
Arsenic	10	10	10
Cadmium	5	5	5
Chromium (total)	100	100	100
Chromium (III)		10000	
Chromium (VI)		21	
Lead	15	15	15[1]
Benzene	5	5	5
1,2-Dichloropropane[2]	5	5	5
Ethylbenzene	700	700	700
Methyl ethyl ketone[2]	4000	4000	4000[3]
Methylene chloride[2]	5	5	5
Toluene	1000	1000	1000
Xylenes	10000	10000	10000

Analysis No Longer Conducted Due to Lack of Contaminant Detections

Notes: ARARs = Applicable or Relevant and Appropriate Requirements
TBC = To Be Considered
SWS = Sitewide Standards for Groundwater from a protected source
MCL = Maximum Contaminant Level
TT:AL = Action Level for Treatment Technique for lead
HAL = Health Advisory Level

[1] Federal Drinking Water Standards specify an Action Level for lead for application of a treatment techique rather than an MCL.

[2] These chemicals are no longer analyzed due to lack of detections.

[3] This chemical has no MCL; SWS is based on a TBC, the lifetime HAL.

TABLE 10
GMW-21 VOCs USED FOR VAPOR INTRUSION RISKS
VOGEL PAINT AND WAX SUPERFUND SITE
SIOUX COUNTY, KS

Date	Ethylbenzene	Xylenes
06/08/16	1,160	2,770
07/14/16	1,520	5,210
12/19/16	233	825
04/13/17	1,170	3,520
06/08/17	455	1,450
07/25/17	984	3,010
12/12/17	1,320	4,310
12/19/17	1,570	4,890
04/05/18	2,160	6,370

All concentrations given in micrograms per liter.

TABLE 11
EPC DETERMINATION FOR VAPOR INTRUSION
CONTAMINANTS
VOGEL PAINT AND WAX SUPERFUND SITE
SIOUX COUNTY, IOWA

UCL Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	1/23/2019 11:46
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	1/0/1900 22:48
Number of Bootstrap Operations	6/22/1905 0:00

Ethylbenzene

General Statistics			
Total Number of Observations	9	Number of Distinct Observations	9
		Number of Missing Observations	0
Minimum	233	Mean	1175
Maximum	2160	Median	1170
SD	581.9	Std. Error of Mean	194
Coefficient of Variation	0.495	Skewness	-0.124

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.0

Normal GOF Test			
Shapiro Wilk Test Statistic	0.966	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.829	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.157	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.295	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	1535	95% Adjusted-CLT UCL (Chen-1995)	1485
		95% Modified-t UCL (Johnson-1978)	1534
Gamma GOF Test			
A-D Test Statistic	0.495	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.726	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.233	Kolmogrov-Smirnoff Gamma GOF Test	
5% K-S Critical Value	0.281	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	3.185	k star (bias corrected MLE)	2.197
Theta hat (MLE)	368.8	Theta star (bias corrected MLE)	534.6
nu hat (MLE)	57.33	nu star (bias corrected)	39.55
MLE Mean (bias corrected)	1175	MLE Sd (bias corrected)	792.5
		Approximate Chi Square Value (0.05)	26.14
Adjusted Level of Significance	0.0231	Adjusted Chi Square Value	23.87
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50)	1777	95% Adjusted Gamma UCL (use when n<50)	1947

TABLE 11 (Continued)
EPC DETERMINATION FOR VAPOR INTRUSION
CONTAMINANTS
VOGEL PAINT AND WAX SUPERFUND SITE
SIOUX COUNTY, IOWA

Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.855	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.829	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.271	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.295	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	5.451	Mean of logged Data	6.904
Maximum of Logged Data	7.678	SD of logged Data	0.693
Assuming Lognormal Distribution			
95% H-UCL	2396	90% Chebyshev (MVUE) UCL	2097
95% Chebyshev (MVUE) UCL	2492	97.5% Chebyshev (MVUE) UCL	3039
99% Chebyshev (MVUE) UCL	4113		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	1494	95% Jackknife UCL	1535
95% Standard Bootstrap UCL	1474	95% Bootstrap-t UCL	1535
95% Hall's Bootstrap UCL	1515	95% Percentile Bootstrap UCL	1468
95% BCA Bootstrap UCL	1478		
90% Chebyshev(Mean, Sd) UCL	1757	95% Chebyshev(Mean, Sd) UCL	2020
97.5% Chebyshev(Mean, Sd) UCL	2386	99% Chebyshev(Mean, Sd) UCL	3105
Suggested UCL to Use			
95% Student's-t UCL	**1535**		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be
reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

TABLE 11 (Continued)
EPC DETERMINATION FOR VAPOR INTRUSION
CONTAMINANTS
VOGEL PAINT AND WAX SUPERFUND SITE
SIOUX COUNTY, IOWA

Total Xylenes

General Statistics			
Total Number of Observations	9	Number of Distinct Observations	9
		Number of Missing Observations	0
Minimum	455	Mean	3484
Maximum	6370	Median	3520
SD	1967	Std. Error of Mean	655.6
Coefficient of Variation	0.564	Skewness	-0.308

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.0

Normal GOF Test			
Shapiro Wilk Test Statistic	0.959	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.829	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.136	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.295	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			

Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	4704	95% Adjusted-CLT UCL (Chen-1995)	4491
		95% Modified-t UCL (Johnson-1978)	4692

Gamma GOF Test			
A-D Test Statistic	0.56	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.729	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.243	Kolmogrov-Smirnoff Gamma GOF Test	
5% K-S Critical Value	0.282	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Gamma Statistics			
k hat (MLE)	2.121	k star (bias corrected MLE)	1.488
Theta hat (MLE)	1643	Theta star (bias corrected MLE)	2342
nu hat (MLE)	38.18	nu star (bias corrected)	26.78
MLE Mean (bias corrected)	3484	MLE Sd (bias corrected)	2856
		Approximate Chi Square Value (0.05)	15.98
Adjusted Level of Significance	0.0231	Adjusted Chi Square Value	14.25

Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	5839	95% Adjusted Gamma UCL (use when n<50)	6548

Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.825	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.829	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.289	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.295	Data appear Lognormal at 5% Significance Level	
Data appear Approximate Lognormal at 5% Significance Level			

Lognormal Statistics			
Minimum of Logged Data	6.12	Mean of logged Data	7.902
Maximum of Logged Data	8.759	SD of logged Data	0.894

Assuming Lognormal Distribution			
95% H-UCL	10443	90% Chebyshev (MVUE) UCL	7333
95% Chebyshev (MVUE) UCL	8928	97.5% Chebyshev (MVUE) UCL	11141
99% Chebyshev (MVUE) UCL	15489		

TABLE 11 (Continued)
EPC DETERMINATION FOR VAPOR INTRUSION
CONTAMINANTS
VOGEL PAINT AND WAX SUPERFUND SITE
SIOUX COUNTY, IOWA

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	4563	95% Jackknife UCL	4704
95% Standard Bootstrap UCL	4505	95% Bootstrap-t UCL	4612
95% Hall's Bootstrap UCL	4551	95% Percentile Bootstrap UCL	4497
95% BCA Bootstrap UCL	4406		
90% Chebyshev(Mean, Sd) UCL	5451	95% Chebyshev(Mean, Sd) UCL	6342
97.5% Chebyshev(Mean, Sd) UCL	7579	99% Chebyshev(Mean, Sd) UCL	10008

Suggested UCL to Use
95% Student's-t UCL 4704

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be
reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

TABLE 12
VAPOR INTRUSION RISKS AT OFF-SITE WELL GMW-21 - HYPOTHETICAL RESIDENT
VOGEL PAINT & WAX SUPERFUND SITE
SIOUX COUNTY, IOWA

Chemical	CAS Number	Site Groundwater Concentration C_{gw} (µg/L)	Site Indoor Air Concentration $C_{i,a}$ (µg/m^3)	VI Carcinogenic Risk CR	VI Hazard HQ	IUR (ug/m^3)$^{-1}$	IUR Ref	Chronic RfC (mg/m^3)	RfC Ref	Temperature (°C) for Groundwater Vapor Concentration	Mutagen ?
Ethylbenzene	100-41-4	1535	495	**1.9E-04**	0.20	0.0000025	C	1	IRIS	11.1	No
Xylenes	1330-20-7	4704	1280		**5.3**			0.1	IRIS	11.1	No
SUM				**1.9E-04**	**5.5**						

Notes: **Bolded** results indicate levels that exceed the "acceptable" cancer risk level of 10^{-5} to 10^{-4} or an HQ of 1, a "safe" level for non-cancer health effects.

VI = vapor intrusion
CAS = Chemical Abstracts Service
µg/L = microgram per liter
µg/m^3 = microgram per cubic meter
CR = cancer risk
HQ = Hazard Quotient
(µg/m^3)$^{-1}$ = per (microgram per cubic meter)
IUR = Inhalation Unit Risk
Ref = reference
C = California Environmental Protection Agency
RfC = Reference Concentration
mg/m^3 = milligram per cubic meter
IRIS = Integrated Risk Information System
°C = degree centigrade

TABLE 13
Comparison of Surface Water Results
Vogel Paint and Wax Company Superfund Site
Sioux County, Iowa

Location	Date	Arsenic	Cadmium	Chromium	Lead	Mercury
Upstream	11/06/09	<0.0100	<0.0010	<0.0100	<0.0100	<0.0010
Upstream	01/13/11	0.00142	<0.0005	<0.0002	<0.0040	<0.0002
Upstream	02/16/11	0.00337	<0.0005	<0.0020	<0.0040	**0.00106**
Upstream	09/27/11	0.00132	<0.0005	<0.0020	<0.0040	<0.0002
Upstream	09/14/17	<0.0020	<0.0005	<0.0005	<0.0005	<0.0002
On-Site	11/06/09	<0.0010	<0.0100	<0.0010	<0.0010	<0.00005
On-Site	11/06/09	<0.0100	<0.0010	<0.0100	<0.0100	<0.0010
On-Site	01/13/11	0.01730	**0.00295**	**0.02230**	**0.02760**	<0.0002
On-Site	02/16/11	0.00302	<0.0005	<0.0020	<0.0040	**0.00163**
On-Site	09/27/11	0.00123	<0.0005	<0.0020	<0.0040	<0.0002
On-Site	09/14/17	<0.0020	<0.0005	<0.0005	<0.0005	0.00216
Downstream	11/06/09	<0.0100	<0.0010	<0.0100	<0.0100	<0.0010
Downstream	01/13/11	<0.0010	<0.0005	<0.0020	<0.0040	<0.0002
Downstream	02/16/11	0.00377	<0.0005	0.0022	<0.0040	**0.00182**
Downstream	09/27/11	0.00152	<0.0005	<0.0020	<0.0040	<0.0002
Downstream	09/14/17	0.00202	<0.0005	<0.0005	<0.0005	<0.0002

Notes: All concentrations presented in milligrams per liter.

[1] Federal Drinking Water Standards specify an Action Level for lead for application of a treatment technique rather than an MCL.

[2] These chemicals are no longer analyzed due to lack of detections.

[3] This chemical has no MCL; SWS is based on a TBC, the lifetime HAL.

TABLE 14
Comparison of Sediment Results to Background
Vogel Paint and Wax Company Superfund Site
Sioux County, Iowa

Location	Date	Arsenic	Cadmium	Chromium	Lead	Mercury
Upstream	09/14/17	5.34	<1.13	17.0	12.0	<0.0194
On-Site	09/14/17	5.13	<0.945	17.5	17.9	0.0239
Downstream	09/14/17	7.75	<0.988	21.6	10.9	<0.0185
		7.76	1.01	33.03	20.72	0.03
		9.24	1.00	33.63	21.00	0.03

Notes: All concentrations presented in milligrams per kilogram

[1] Federal Drinking Water Standards specify an Action Level for lead for application of a treatment techique rather than an MCL.

[2] These chemicals are no longer analyzed due to lack of detections.

[3] This chemical has no MCL; SWS is based on a TBC, the lifetime HAL.

APPENDIX G

FIGURES

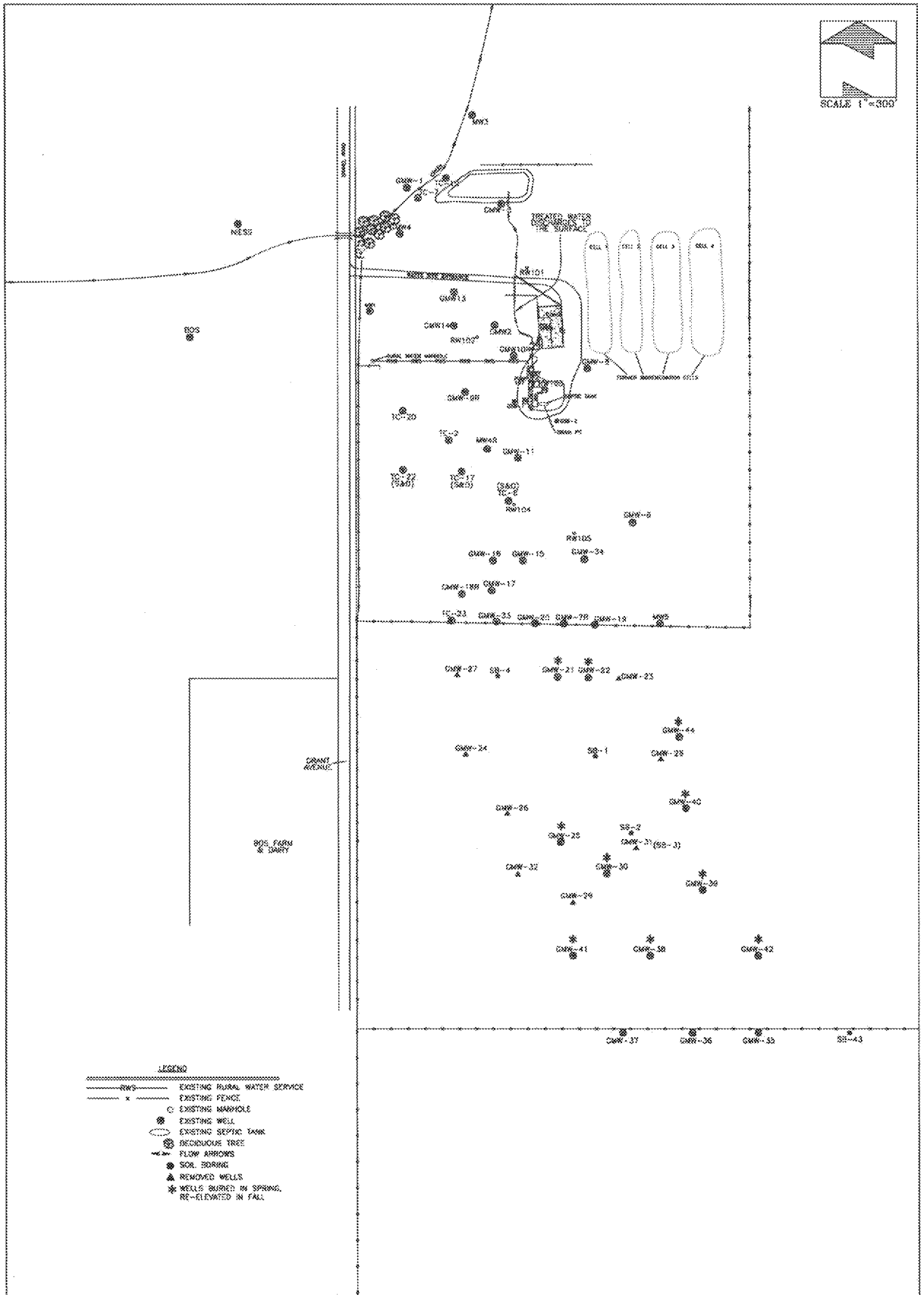


FIGURE 1
SITE MAP
VOGEL PAINT WASTE SITE
MAURICE, IOWA

ORIGINAL DRAWING FURNISHED BY DGR & ASSOCIATES CO.

ACAD\GEOTEK\KEITH\91-400

PROJECT #: 91-400

DRAWN BY: JLS CHECKED BY:

GEOTEK ENGINEERING & TESTING SERVICES, INC.

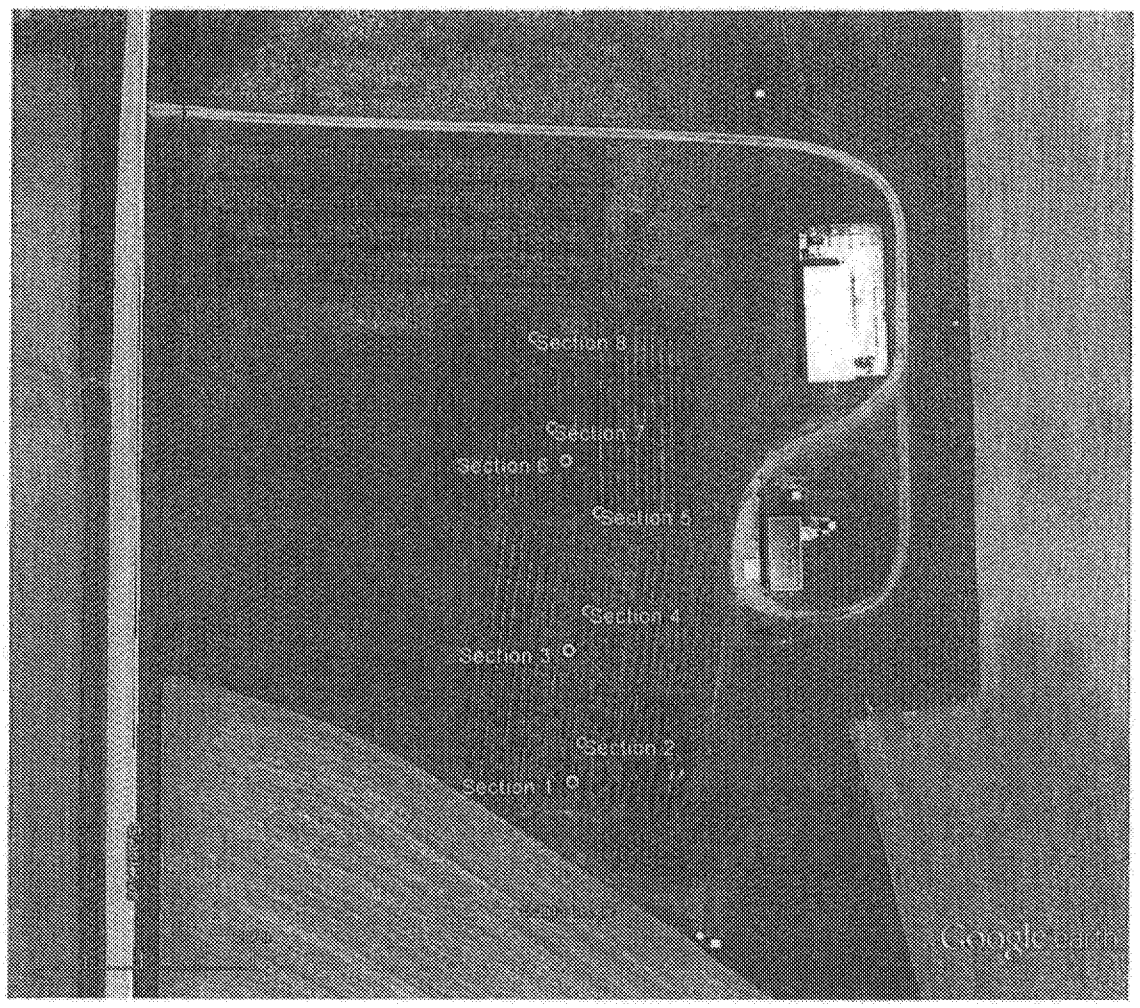


Figure 2

Vogel's - Tree core sample sections. Tree core samples collected 11/10/2016.

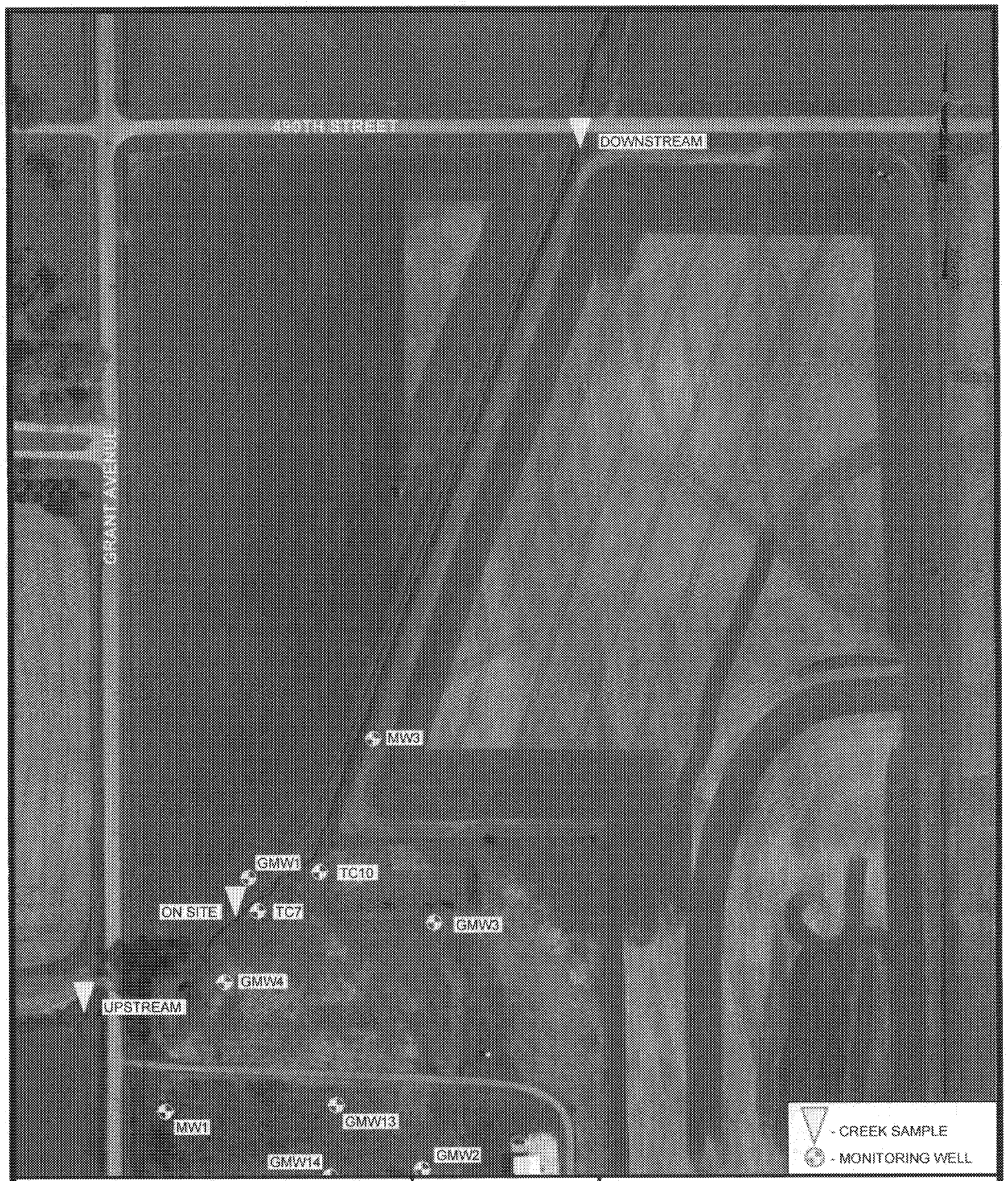


FIGURE 3
CREEK SAMPLE LOCATIONS
VOGEL PAINT WASTE SITE
MAURICE, IA

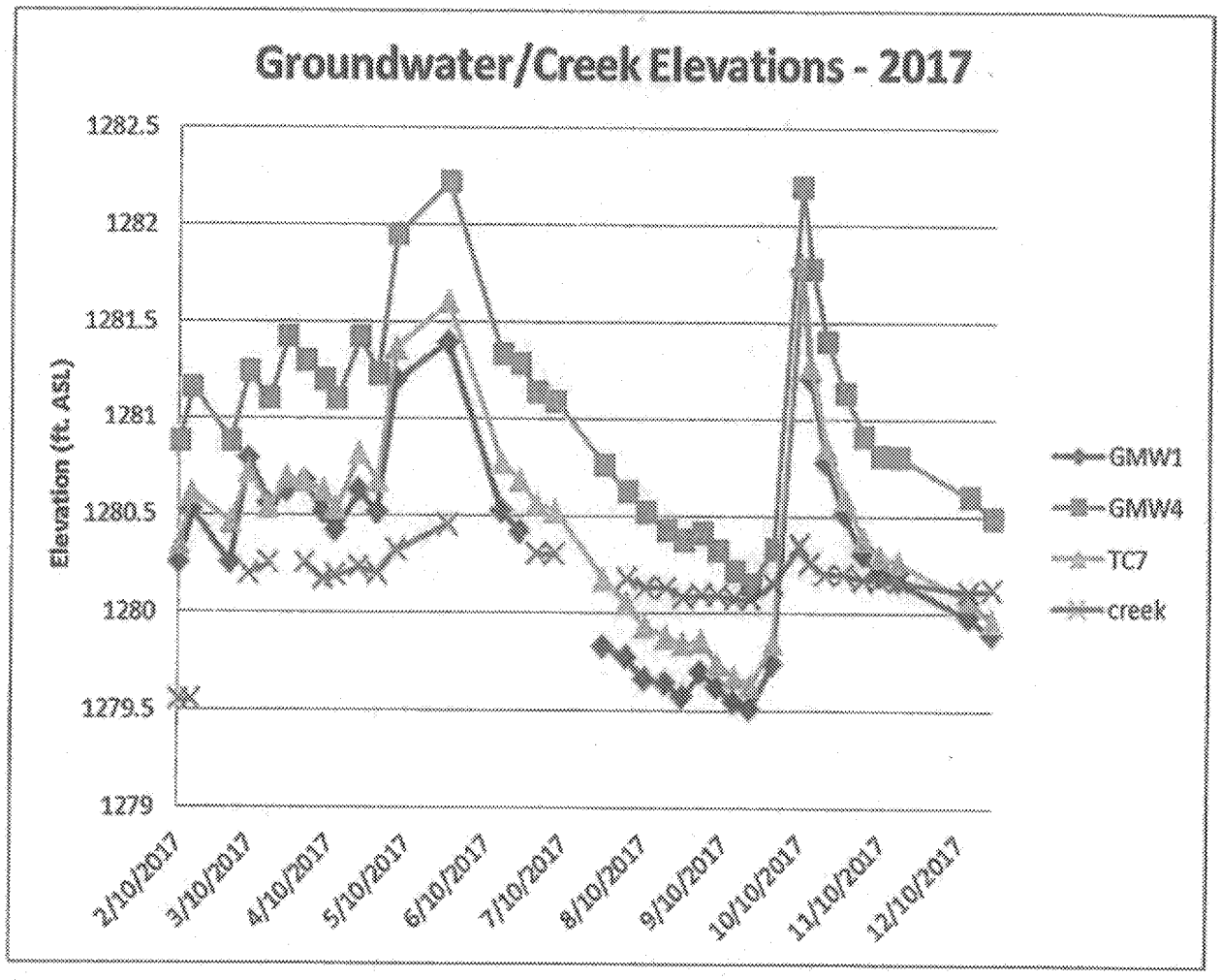
ACAD/GEOTEK/KEITH/91-400

PROJECT#: 91-400

DRAWN BY: CDW

GEOTEK ENGINEERING & TESTING SERVICES, INC.
909 East 50th Street North
Sioux Falls, South Dakota 57104
605-335-5512 Fax 605-335-0773

Figure 4


Groundwater/Creek Elevations - 2017
Elevation (ft. ASL)
1282.5
1282
1281.5
1281
1280.5
1280
1279.5
1279
2/10/2017
3/10/2017
4/10/2017
5/10/2017
6/10/2017
7/10/2017
8/10/2017
9/10/2017
10/10/2017
11/10/2017
12/10/2017
GMW1
GMW4
TC7
creek

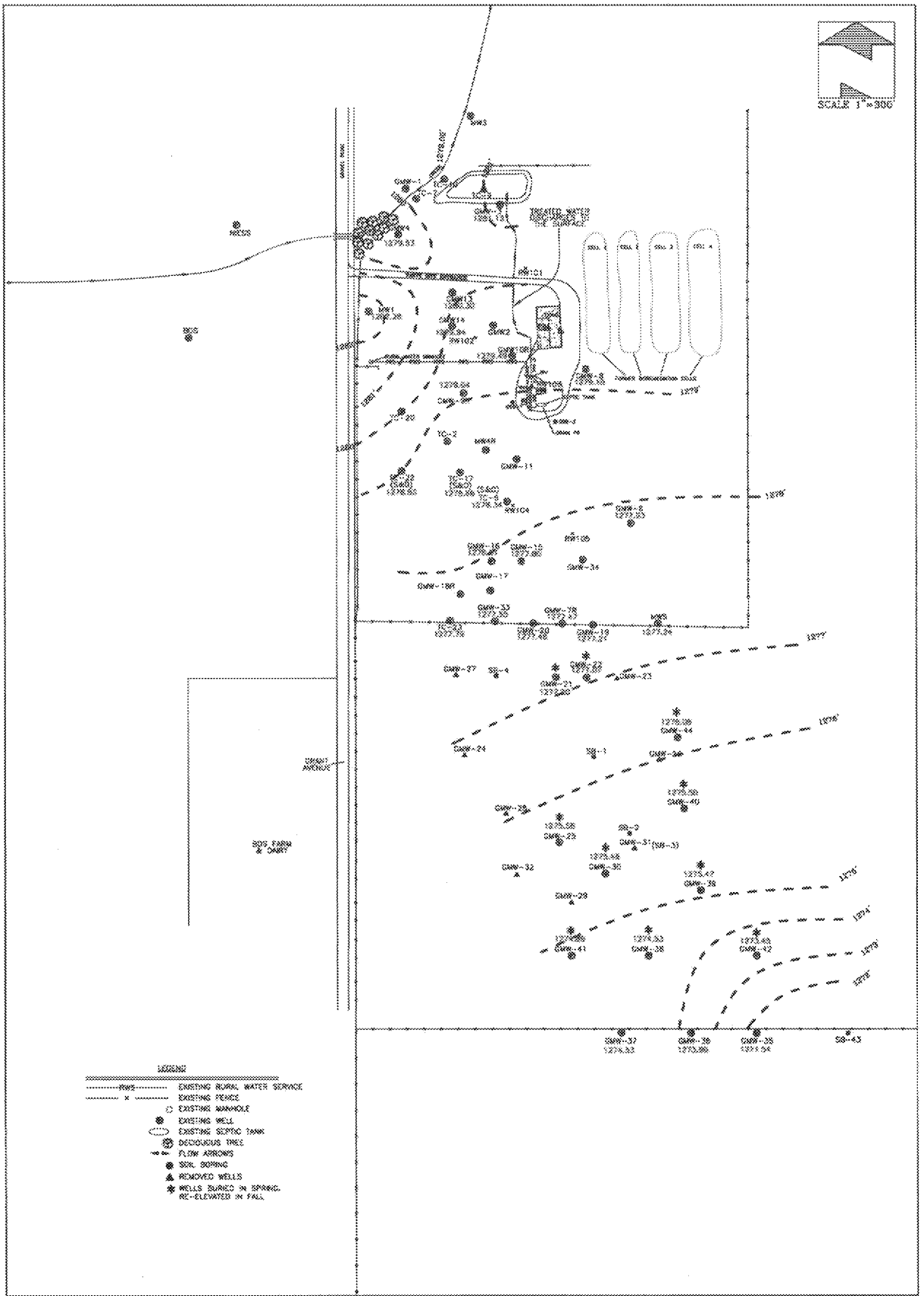


FIGURE 5
GROUNDWATER CONTOUR MAP
BASED ON 3/22/2018 WATER LEVELS
VOGEL PAINT WASTE SITE
MAURICE, IOWA

ORIGINAL DRAWING FURNISHED BY SGS & ASSOCIATES CO.

ACAD\GEOTEK\KEITH\91-400

PROJECT #: 91-400

DRAWN BY: JLS CHECKED BY:

GEOTEK ENGINEERING & TESTING SERVICES, INC.

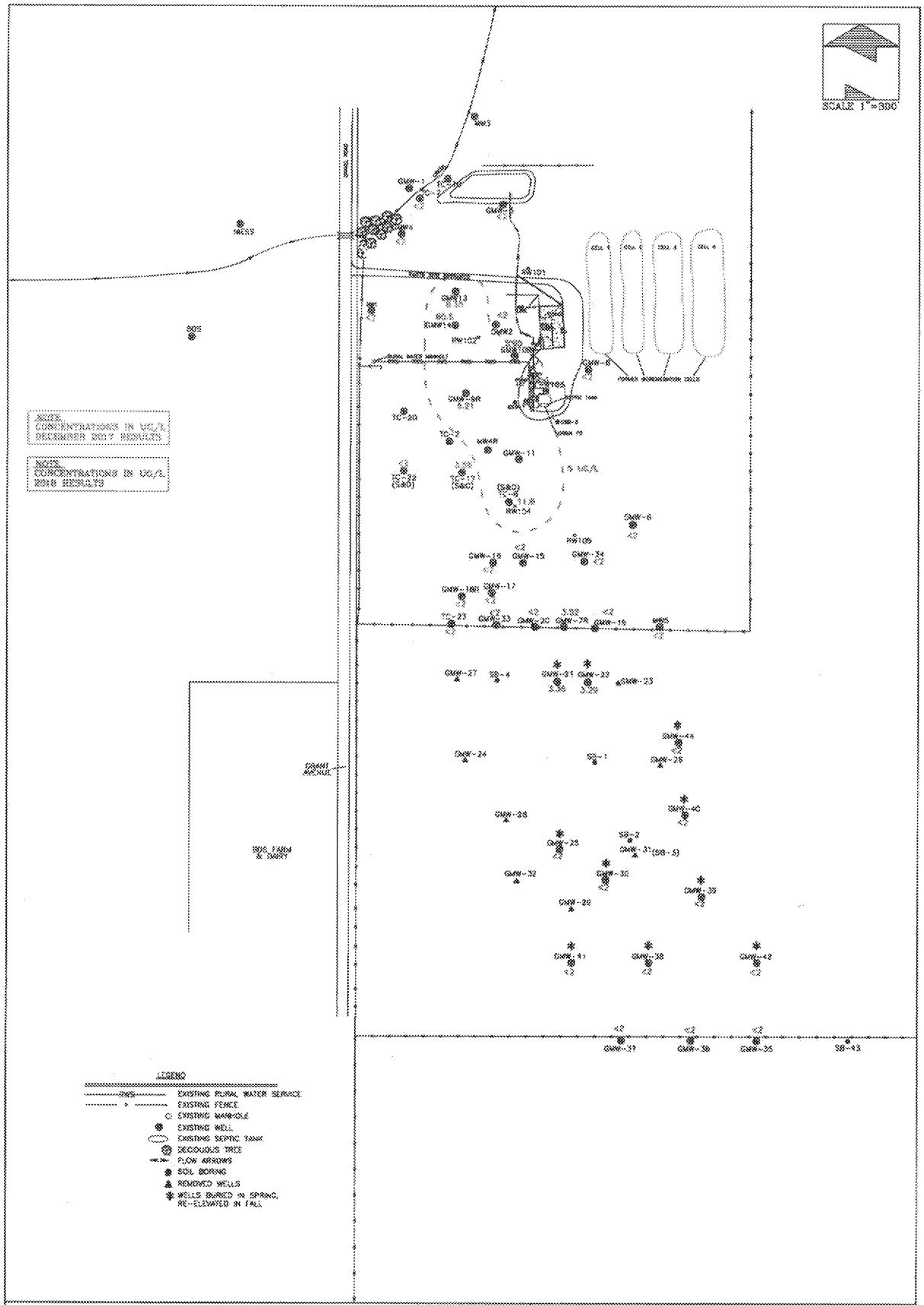


FIGURE 6
BENZENE PLUME MAP
VOGEL PAINT WASTE SITE
MAURICE, IOWA

ORIGINAL DRAWING FURNISHED BY ISG & ASSOCIATES CO.

ACAD\GEOTEK\KEITH\91-400

PROJECT #: 91-400

DRAWN BY: JLS CHECKED BY:

GEOTEK ENGINEERING & TESTING SERVICES, INC.

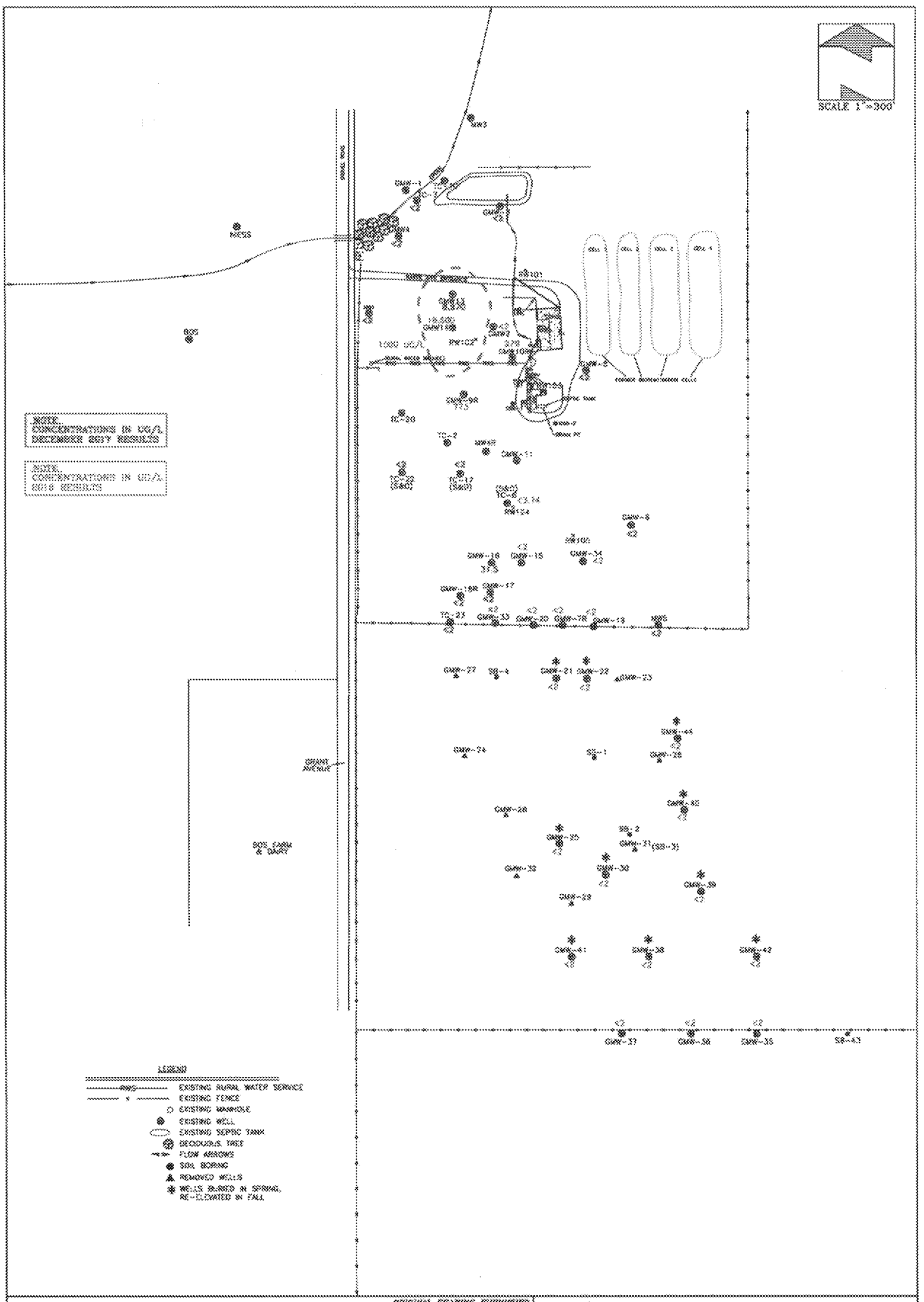


FIGURE 7
TOLUENE PLUME MAP
VOGEL PAINT WASTE SITE
MAURICE, IOWA

ORIGINAL DRAWING FURNISHED BY DGR & ASSOCIATES CO.

ACAD\GEOTEK\KEITH\91-400

PROJECT #: 91-400

DRAWN BY: JLS CHECKED BY:

GEOTEK ENGINEERING & TESTING SERVICES, INC.

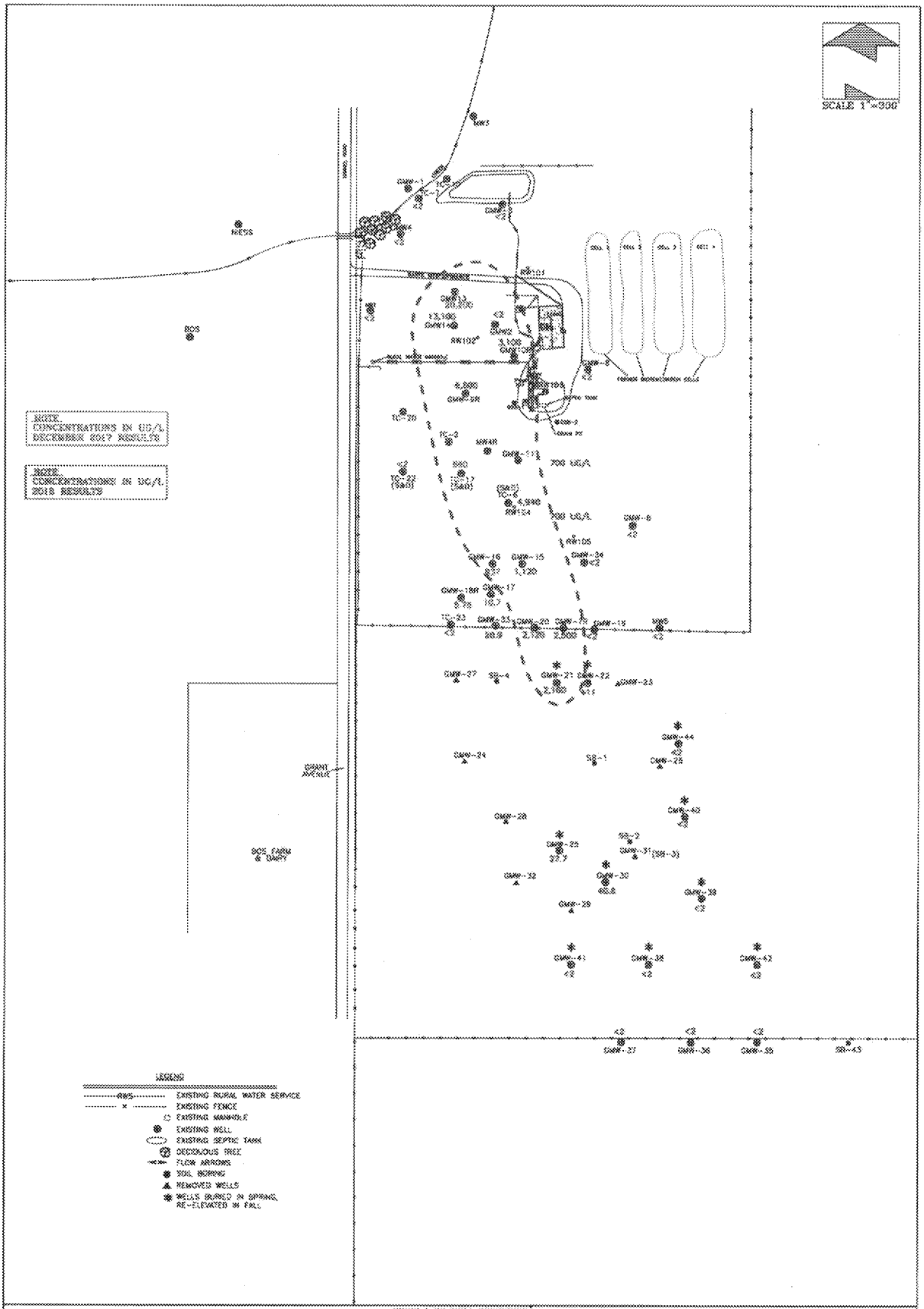


FIGURE 8
ETHYLBENZENE PLUME MAP
VOGEL PAINT WASTE SITE
MAURICE, IOWA

ORIGINAL DRAWING FURNISHED BY DGR & ASSOCIATES CO.

ACAD\GEOTEK\KEITH\91-400

PROJECT #: 91-400

DRAWN BY: JLS CHECKED BY:

GEOTEK ENGINEERING & TESTING SERVICES, INC.

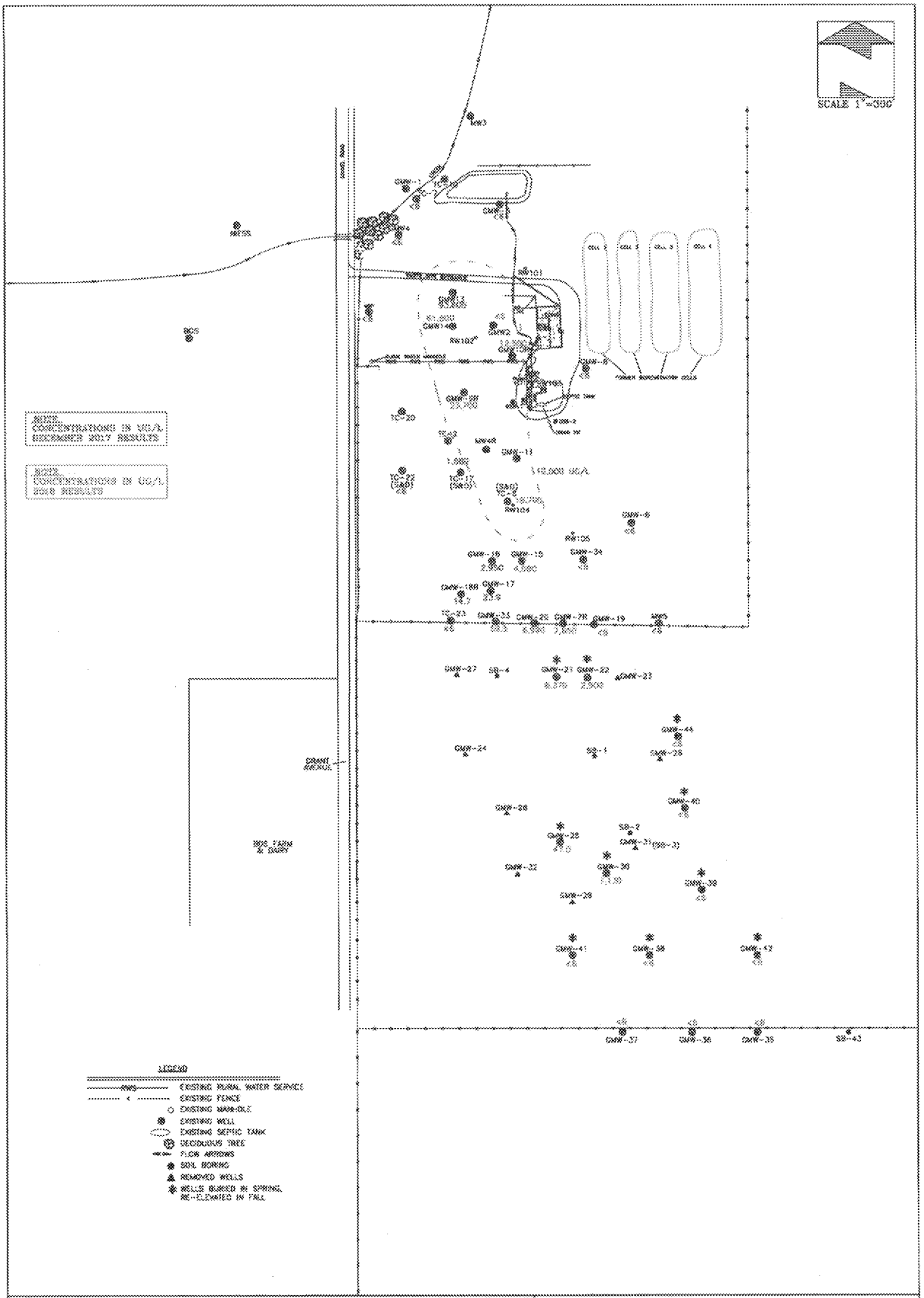


FIGURE 9
XYLENE PLUME MAP
VOGEL PAINT WASTE SITE
MAURICE, IOWA

ORIGINAL DRAWING FURNISHED BY DGR & ASSOCIATES CO.

ACAD\GEOTEK\KEITH\91-400

PROJECT #: 91-400

DRAWN BY: JLS CHECKED BY:

GEOTEK ENGINEERING & TESTING SERVICES, INC.

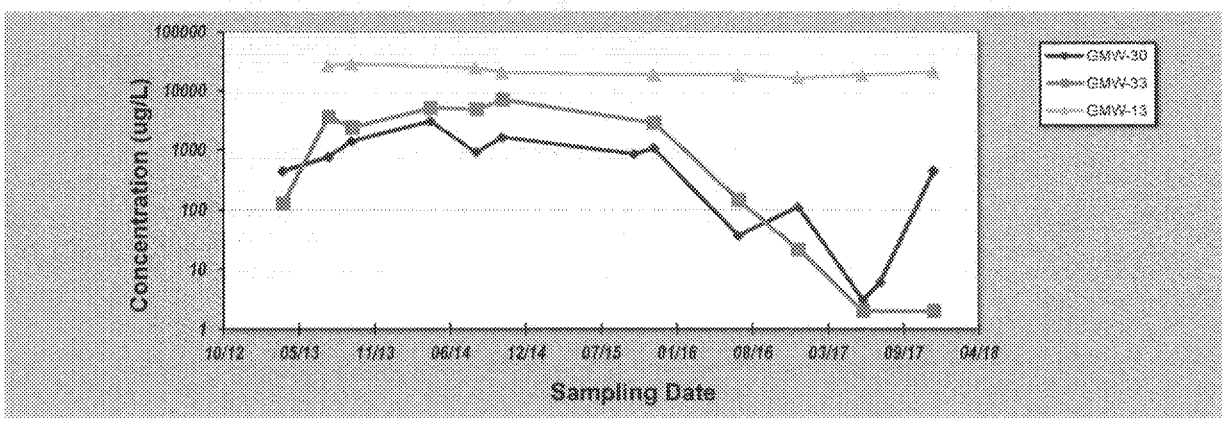
APPENDIX H
STATISTICAL ANALYSIS

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: March 9, 2017
Facility Name: Vogel Paint & Wax Co. Site
Conducted By: GeoTek

Job ID: 91-400
Constituent: Ethylbenzene
Concentration Units: ug/L

Sampling Point ID:	GMW-30	GMW-33	GMW-13				
Sampling Event	Sampling Date	ETHYLBENZENE CONCENTRATION (ug/L)						
1	26-Mar-13	432	126					
2	24-Jul-13	731	3553	25600				
3	25-Sep-13	1380	2370	27900				
4	21-Apr-14	2970	6040					
5	20-Aug-14	892	4790	23600				
6	29-Oct-14	1590	6910	20000				
7	12-Oct-15	832						
8	3-Dec-15	1040	2800	18200				
9	14-Jul-16	36	145	18100				
10	19-Dec-16	111	21	16100				
11	8-Jun-17	3	2	18000				
12	25-Jul-17	6						
13	13-Dec-17	433	2	20200				
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		1.04	1.00	0.18				
Mann-Kendall Statistic (S):		-38	-44	-64				
Confidence Factor:		85.8%	94.8%	99.8%				
Concentration Trend:		Prob. Decreasing	Prob. Decreasing	Decreasing				



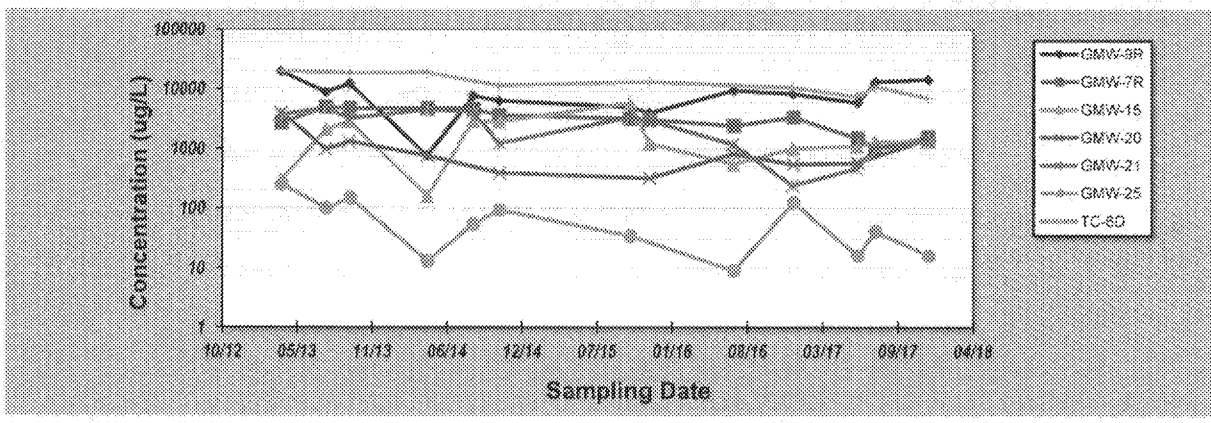
Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	March 9, 2017	Job ID:	91-400
Facility Name:	Vogel Paint & Wax Co. Site	Constituent:	Ethylbenzene
Conducted By:	GeoTek	Concentration Units:	ug/L

Sampling Event	Sampling Date	GMW-9R	GMW-7R	GMW-15	GMW-20	GMW-21	GMW-25	TC-6D
		ETHYLBENZENE CONCENTRATION (ug/L)						
1	26-Mar-13	19000	2710	284	4030	3630	247	19500
2	24-Jul-13	8740	4970	2060	963	4730	100	
3	25-Sep-13	12000	4890	2820	1300	3170	146	17600
4	21-Apr-14	746	4700	158	749	4430	13	18200
5	20-Aug-14	7550	4600	2820		4110	54	
6	29-Oct-14	6230	3610	2770	363	1200	92	11200
7	12-Oct-15	4910	3150	5720		3260	34	
8	3-Dec-15	3920	3030	1200	310	2920		12600
9	14-Jul-16	9310	2410	540	811	1160	9	
10	19-Dec-16	8180	3340	992	537	233	124	10400
11	8-Jun-17	5830	1480	1080	573	455	16	7300
12	25-Jul-17	12900	998	1280		984	41	10800
13	13-Dec-17	14200	1570	1330	1430	1320	16	6960
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		0.65	0.42	0.85	0.96	0.65	0.96	0.37
Mann-Kendall Statistic (S):		2	-50	1	-11	-48	-27	-28
Confidence Factor:		52.4%	99.9%	50.0%	81.9%	99.5%	98.3%	99.9%
Concentration Trend:		No Trend	Decreasing	No Trend	Stable	Decreasing	Decreasing	Decreasing



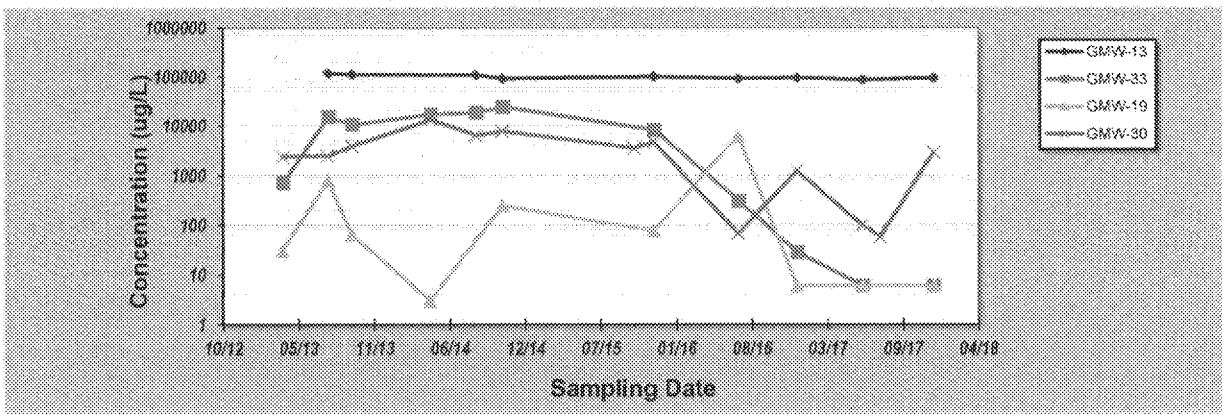
Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	March 9, 2018	Job ID:	91-400
Facility Name:	Vogel Paint & Wax Co. Site	Constituent:	Xylenes
Conducted By:	GeoTek	Concentration Units:	ug/L

Sampling Point ID:	GMW-13	GMW-33	GMW-19	GMW-30			
Sampling Event	Sampling Date	XYLENES CONCENTRATION (ug/L)						
1	26-Mar-13		711	30	2350			
2	24-Jul-13	116000	16300	775	2410			
3	25-Sep-13	110000	10500	62	3740			
4	21-Apr-14		16900	3	13200			
5	20-Aug-14	108000	18400		5320			
6	29-Oct-14	90900	23900	245	7600			
7	12-Oct-15				3500			
8	3-Dec-15	96300	5220	75	4600			
9	14-Jul-16	92100	306	6150	86			
10	16-Dec-16	94500	28	9	1220			
11	8-Jan-17	88300	6	6	98			
12	25-Jul-17				58			
13	13-Dec-17	93600	6	6	2910			
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		0.10	1.64	2.61	1.06			
Mann-Kendall Statistic (S):		-22	-24	-8	-24			
Confidence Factor:		99.8%	99.9%	72.8%	99.9%			
Concentration Trend:		Decreasing	Decreasing	No Trend	Prob. Decreasing			



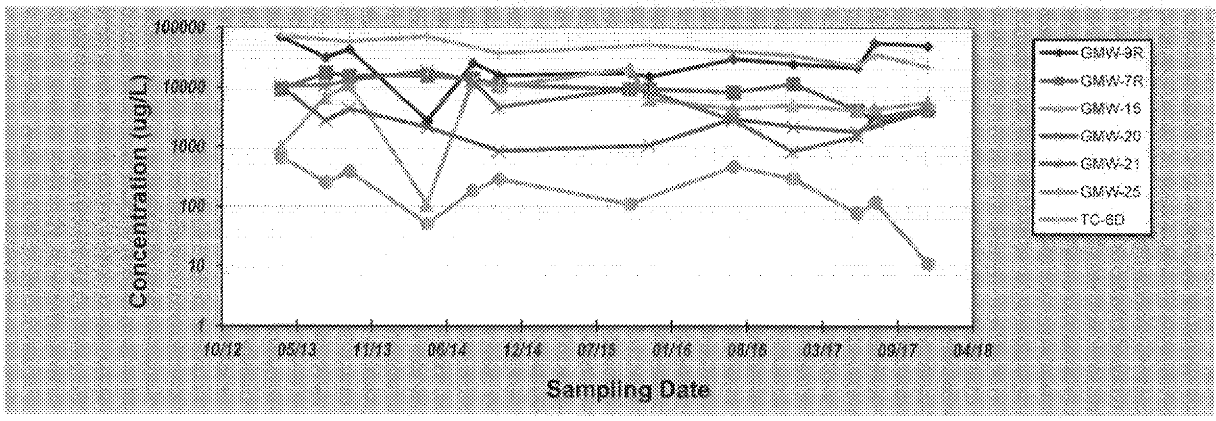
Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(5):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

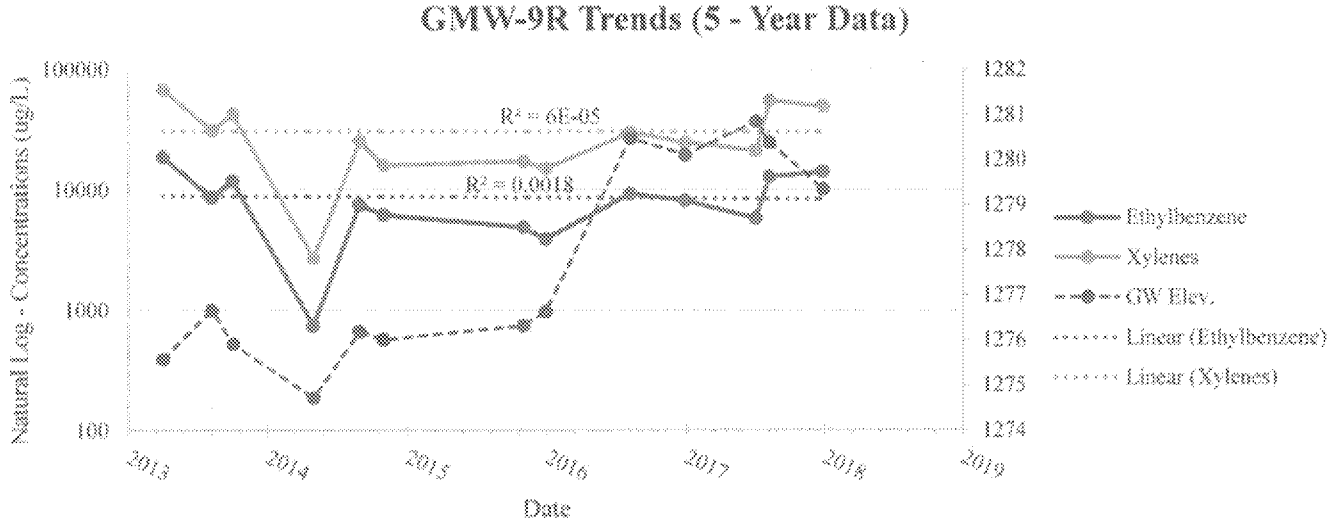
Evaluation Date:	March 9, 2017	Job ID:	91-400
Facility Name:	Vogel Paint & Wax Co. Site	Constituent:	Xylenes
Conducted By:	GeoTek	Concentration Units:	ug/L

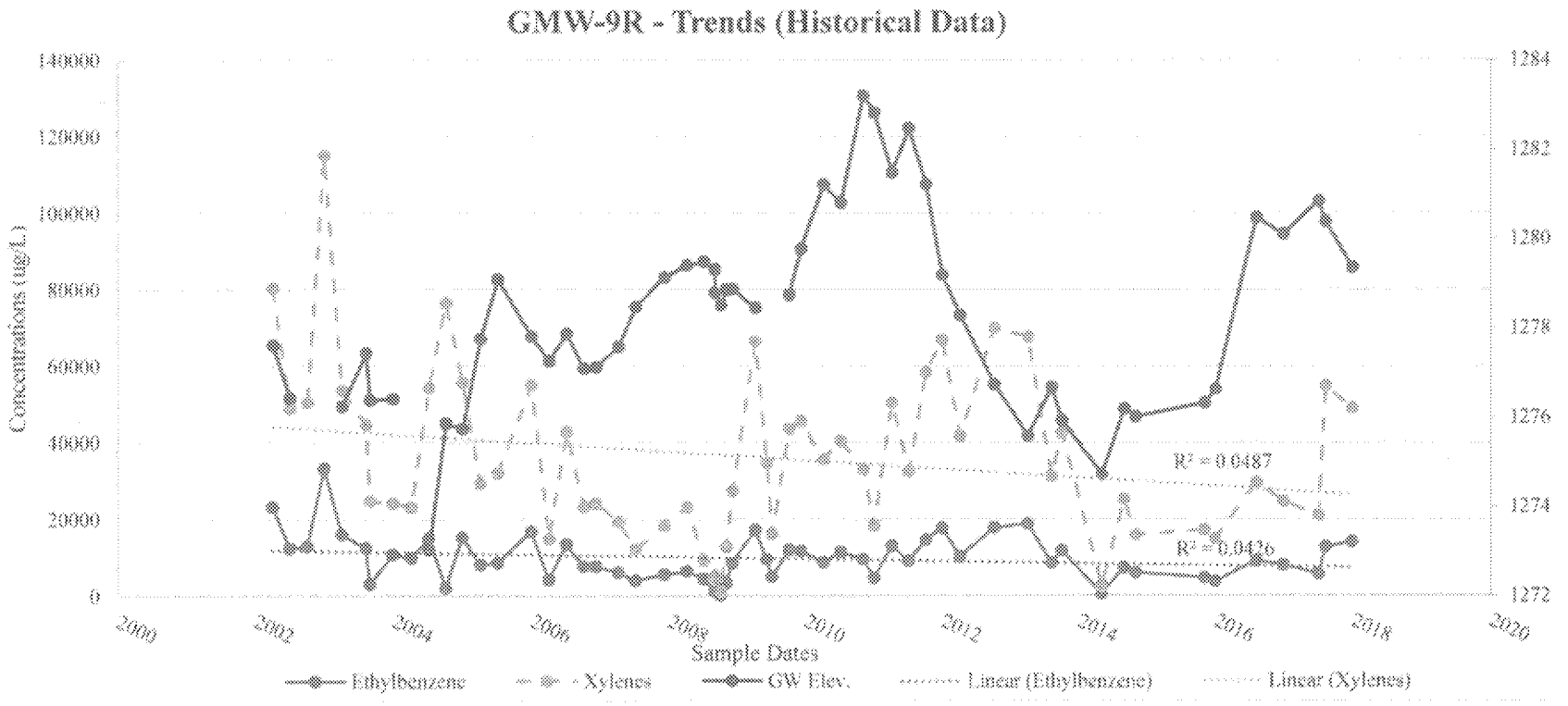
Sampling Event	Sampling Date	GMW-9R	GMW-7R	GMW-15	GMW-20	GMW-21	GMW-25	TC-6D
		XYLENES CONCENTRATION (ug/L)						
1	26-Mar-13	67600	9280	983	10200	10400	657	71500
2	24-Jul-13	31200	17300	6680	2710	10600	250	
3	25-Sep-13	42500	15400	10900	4290	12900	381	57200
4	21-Apr-14	2700	15600	107	2100	18500	51	70000
5	20-Aug-14	25200	13800	12400		12700	181	
6	29-Oct-14	15900	11100	10100	842	4580	285	36800
7	12-Oct-15	17200	8330	20400		9450	110	
8	3-Dec-15	14900	9330	6240	1040	8400		50000
9	14-Jul-16	29600	8280	4310	2930	2770	462	
10	19-Dec-16	24600	11400	4990	2160	825	291	33700
11	8-Jun-17	21000	4120	4040	1780	1450	76	22400
12	25-Jul-17	54800	2700	4320		3010	118	35300
13	13-Dec-17	48000	4130	5460	4180	4310	11	21800
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		0.60	0.46	0.77	0.24	0.85	0.78	0.43
Mann-Kendall Statistic (S):		0	-47	8	-3	-42	-24	-28
Confidence Factor:		47.6%	99.9%	66.2%	75.8%	99.5%	94.2%	99.9%
Concentration Trend:		Stable	Decreasing	Stable	Stable	Decreasing	Prob. Decreasing	Decreasing

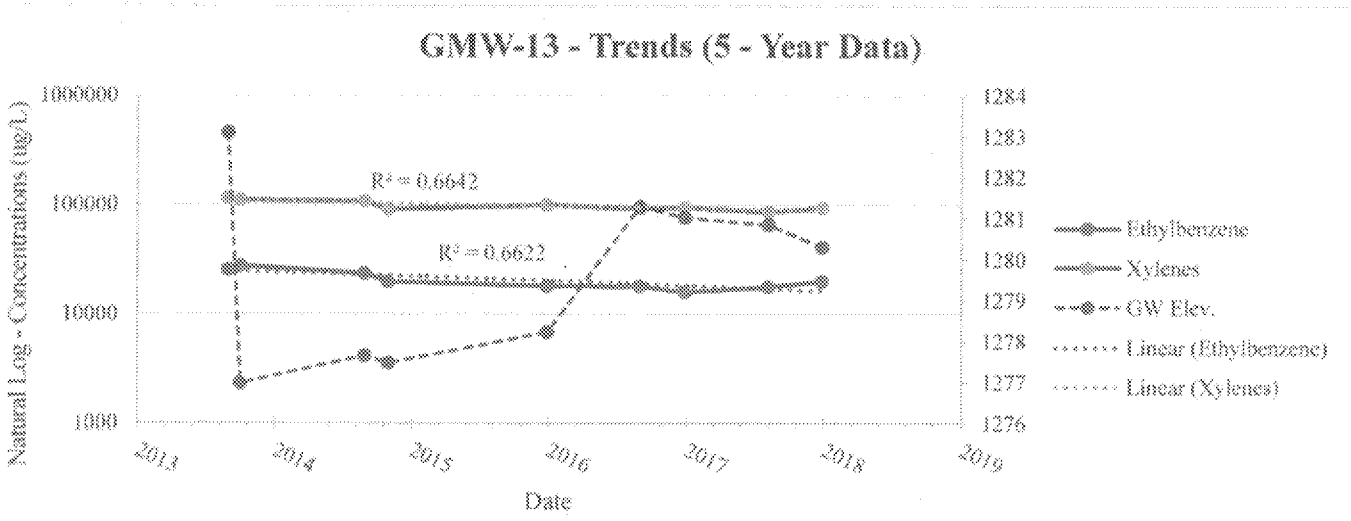


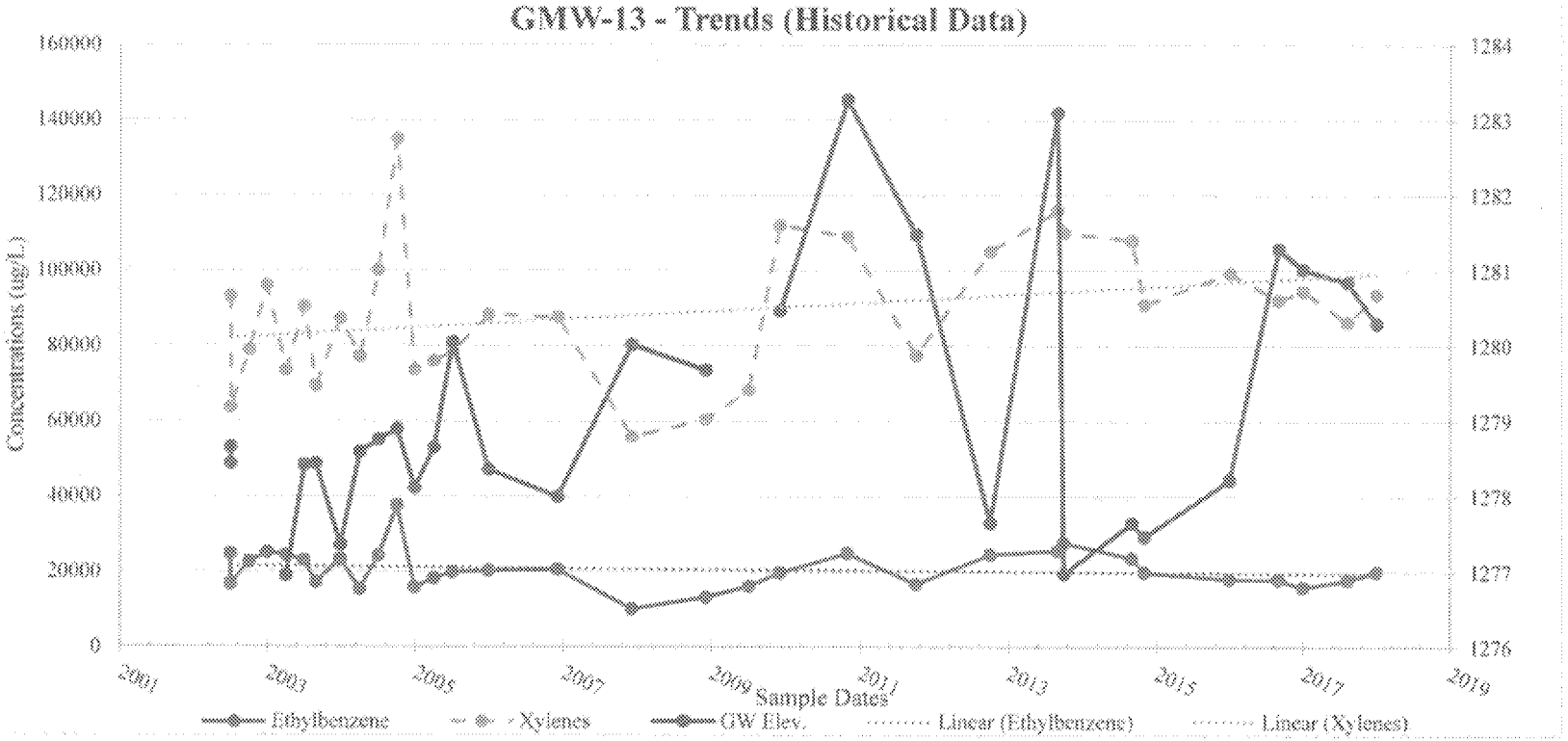
Notes:

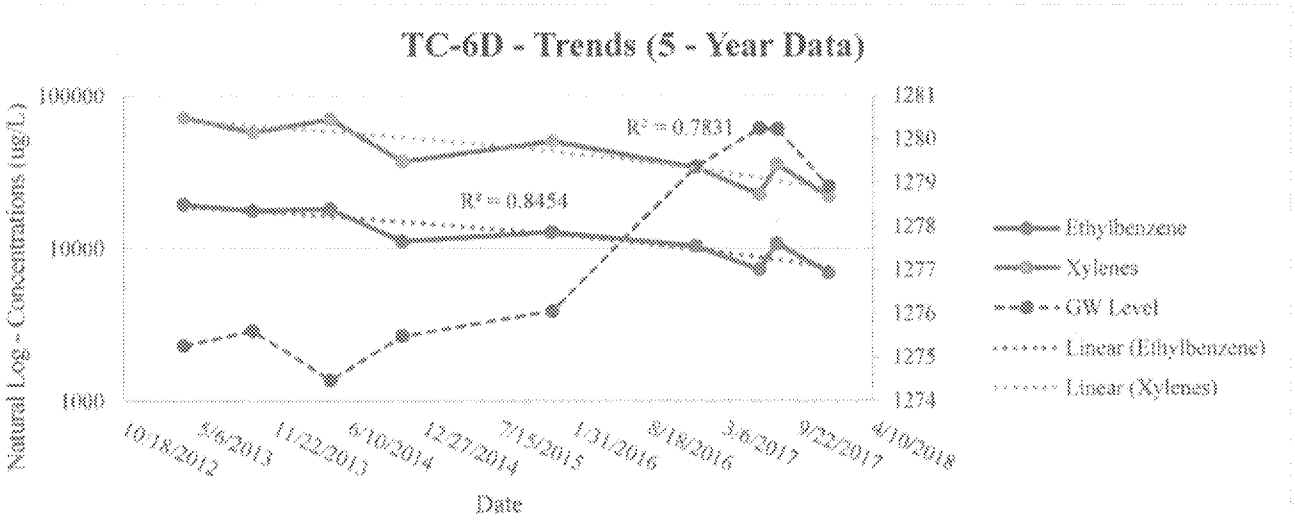
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

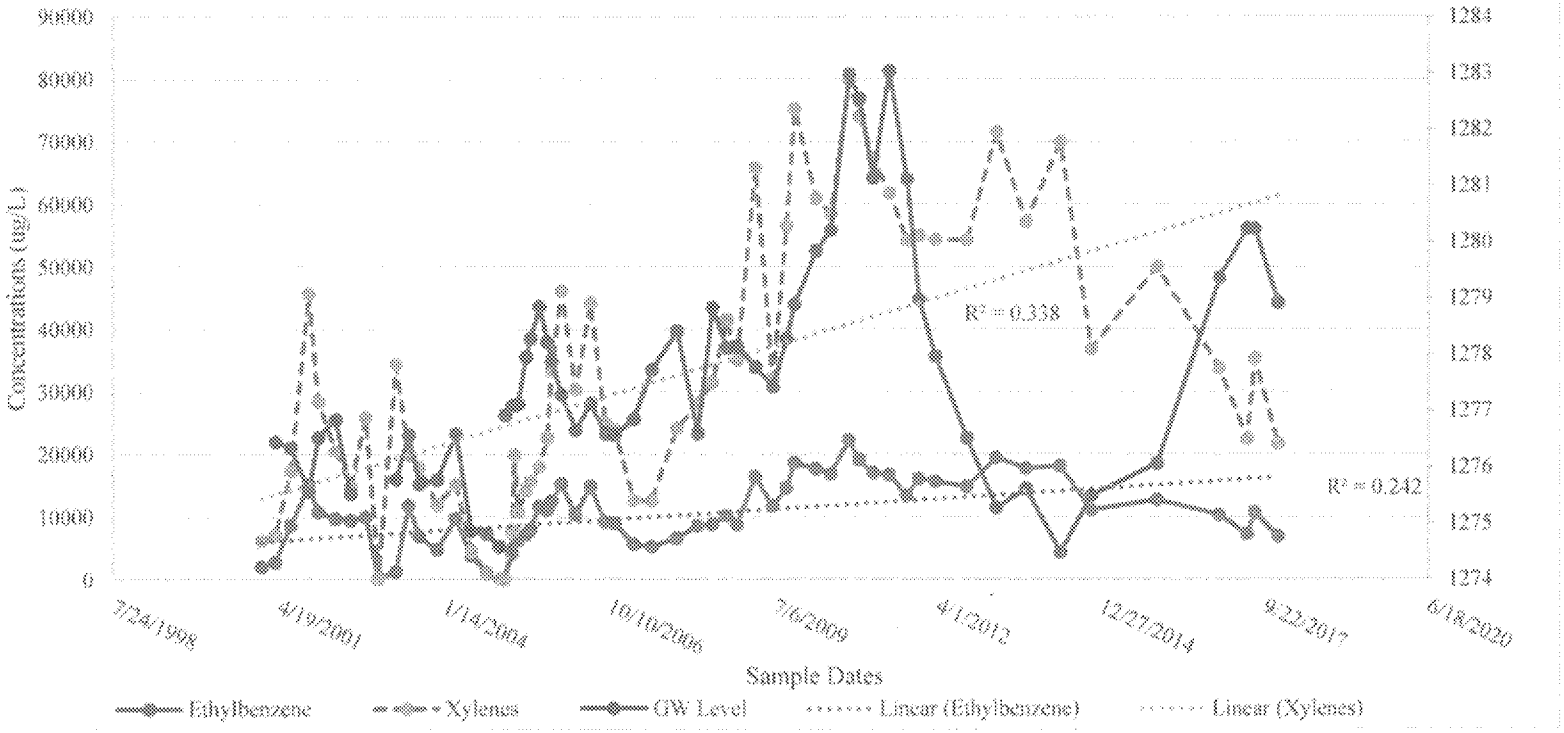

GMW-9R Trends (5 - Year Data)
Natural Log - Concentrations (ug/L)
100000
10000
1000
100
1282
1281
1280
1279
1278
1277
1276
1275
1274
R² = 6E-05
R² = 0.0018
2013
2014
2015
2016
2017
2018
2019
Date
Ethylbenzene
Xylenes
GW Elev.
Linear (Ethylbenzene)
Linear (Xylenes)

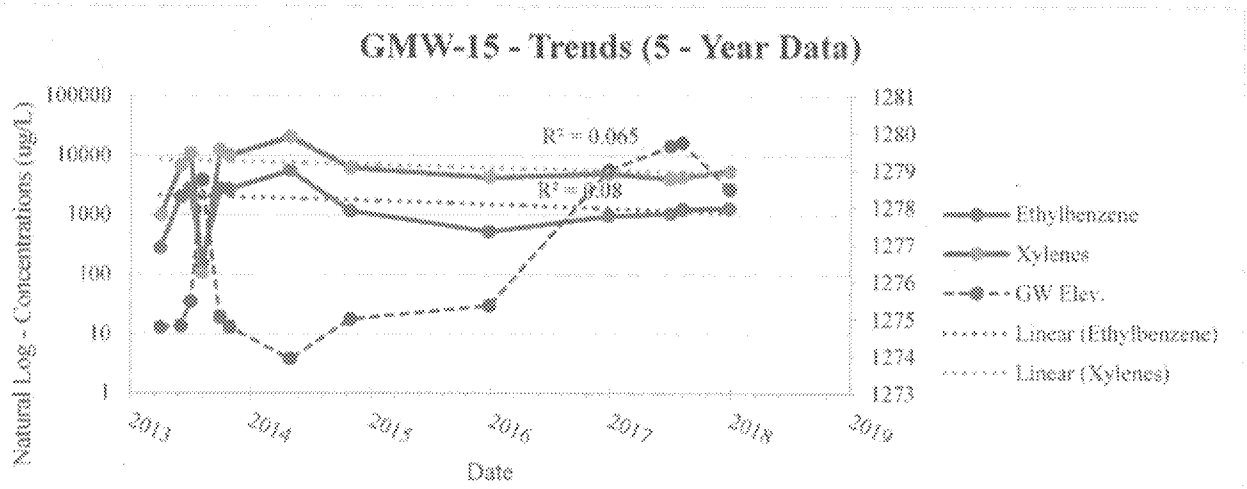

GMW-9R - Trends (Historical Data)
Concentrations (ug/L)
140000
120000
100000
80000
60000
40000
20000
0
1284
1282
1280
1278
1276
1274
1272
R² = 0.0487
R² = 0.0436
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Sample Dates
Ethylbenzene
Xylenes
GW Elev.
Linear (Ethylbenzene)
Linear (Xylenes)

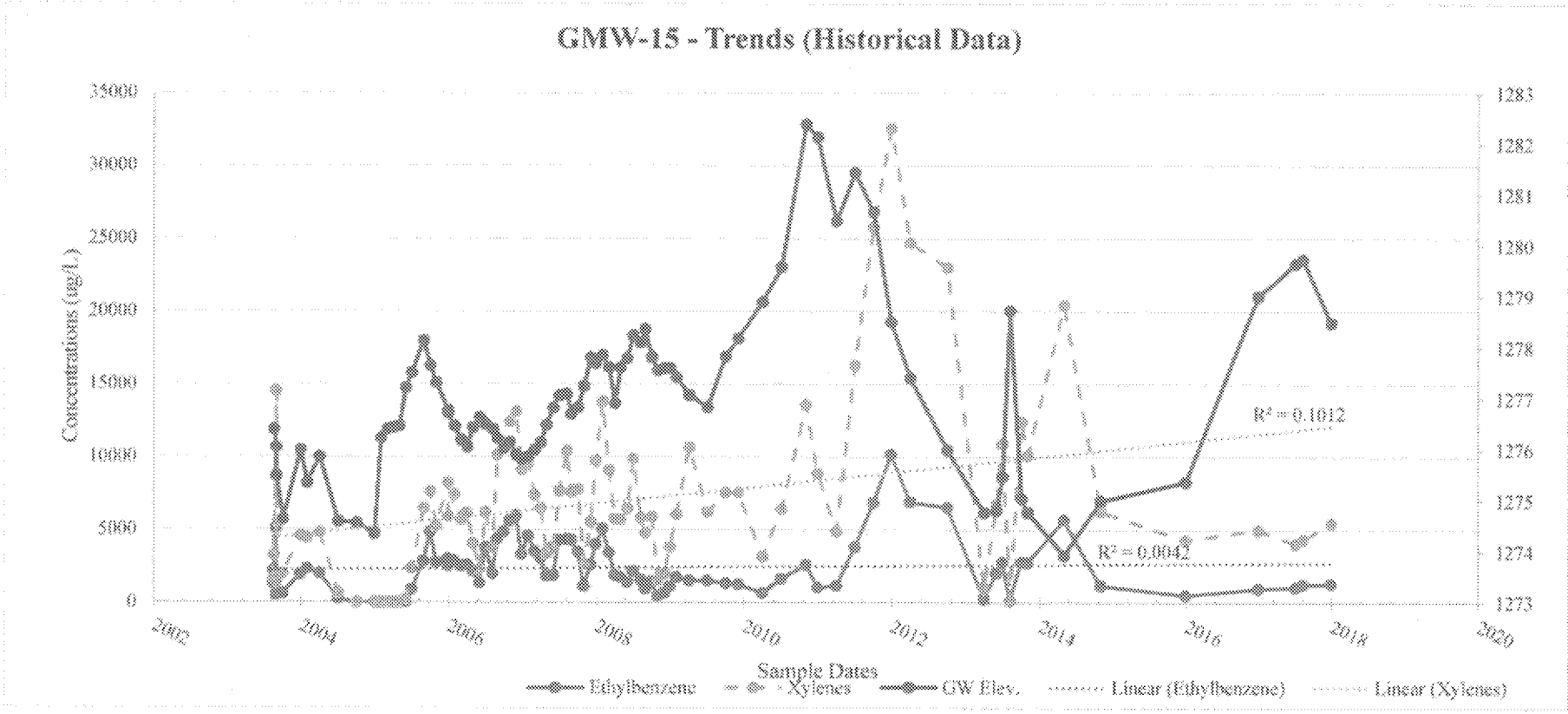

GMW-13 - Trends (5 - Year Data)
Natural Log - Concentrations (ug/L)
1000000
100000
10000
1000
1284
1283
1282
1281
1280
1279
1278
1277
1276
R² = 0.6642
R² = 0.6622
2013
2014
2015
2016
2017
2018
2019
Date
Ethylbenzene
Xylenes
GW Elev.
Linear (Ethylbenzene)
Linear (Xylenes)

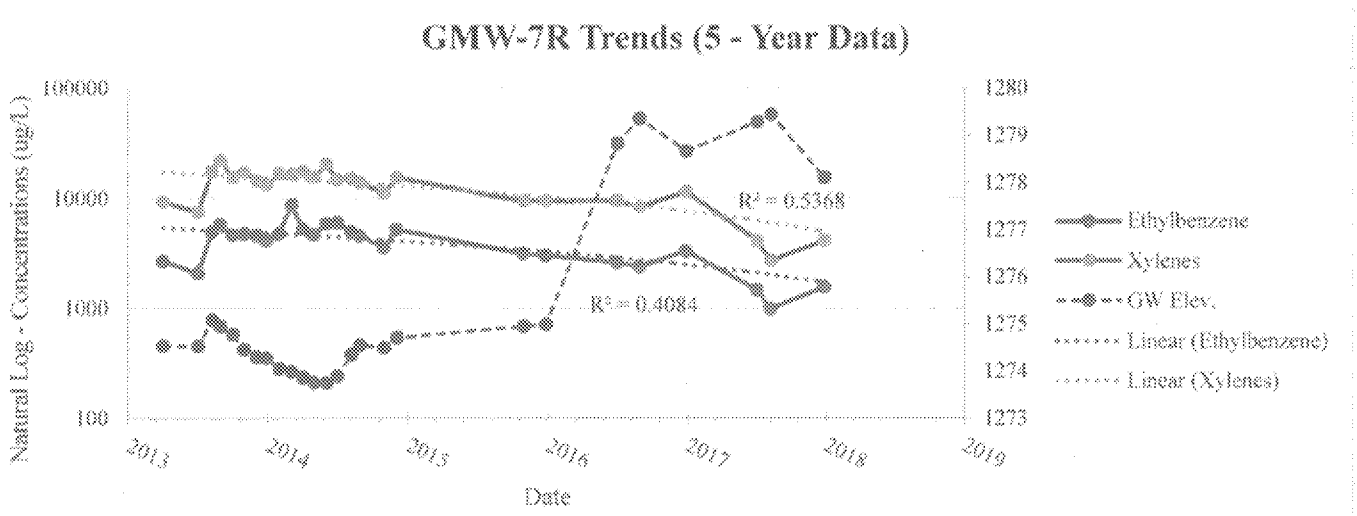

GMW-13 - Trends (Historical Data)
Concentrations (ug/L)
160000
140000
120000
100000
80000
60000
40000
20000
0
1284
1283
1282
1281
1280
1279
1278
1277
1276
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
Sample Dates
Ethylbenzene
Xylenes
GW Elev.
Linear (Ethylbenzene)
Linear (Xylenes)

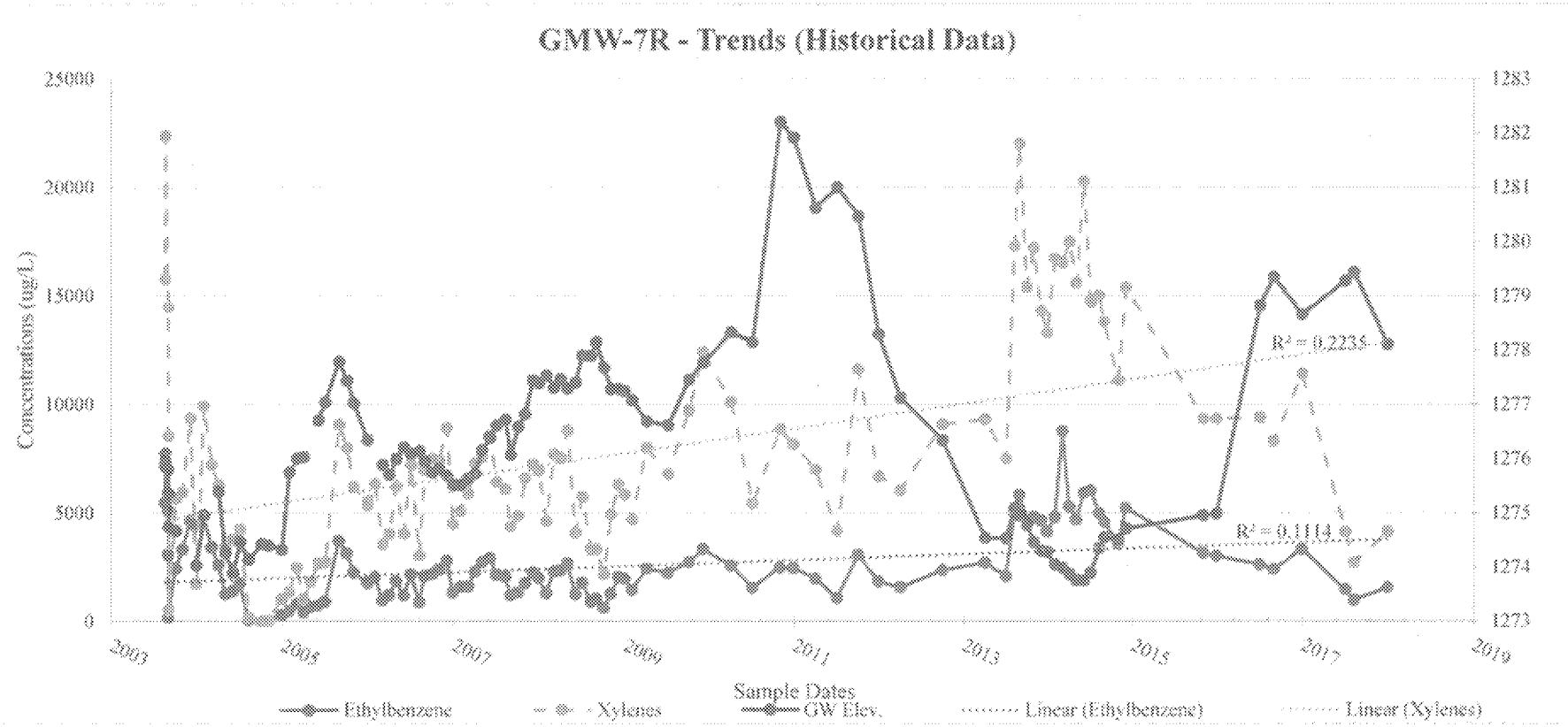

TC-6D - Trends (5 - Year Data)
Natural Log - Concentrations (ug/L)
100000
10000
1000
1281
1280
1279
1278
1277
1276
1275
1274
R² = 0.7831
R² = 0.8454
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
7/15/2015
1/31/2016
8/18/2016
3/6/2017
9/22/2017
4/10/2018
Date
Ethylbenzene
Xylenes
GW Level
Linear (Ethylbenzene)
Linear (Xylenes)

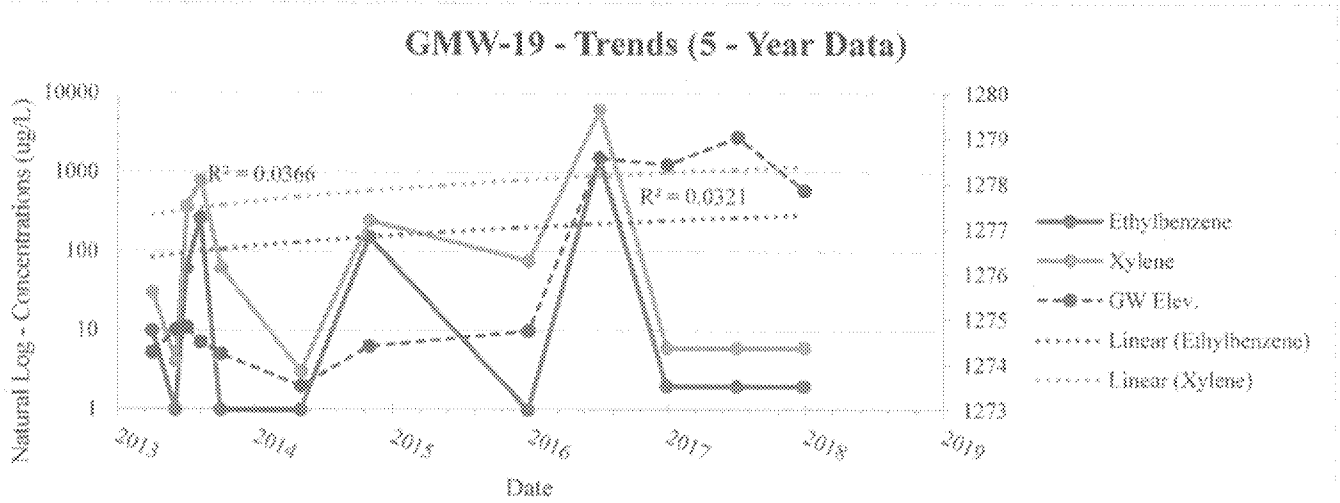

TC-6D - Trends (Historical)
Concentrations (ug/L)
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
1284
1283
1282
1281
1280
1279
1278
1277
1276
1275
1274
R² = 0.338
R² = 0.242
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
12/27/2014
9/22/2017
6/18/2020
Sample Dates
Ethylbenzene
Xylenes
GW Level
Linear (Ethylbenzene)
Linear (Xylenes)

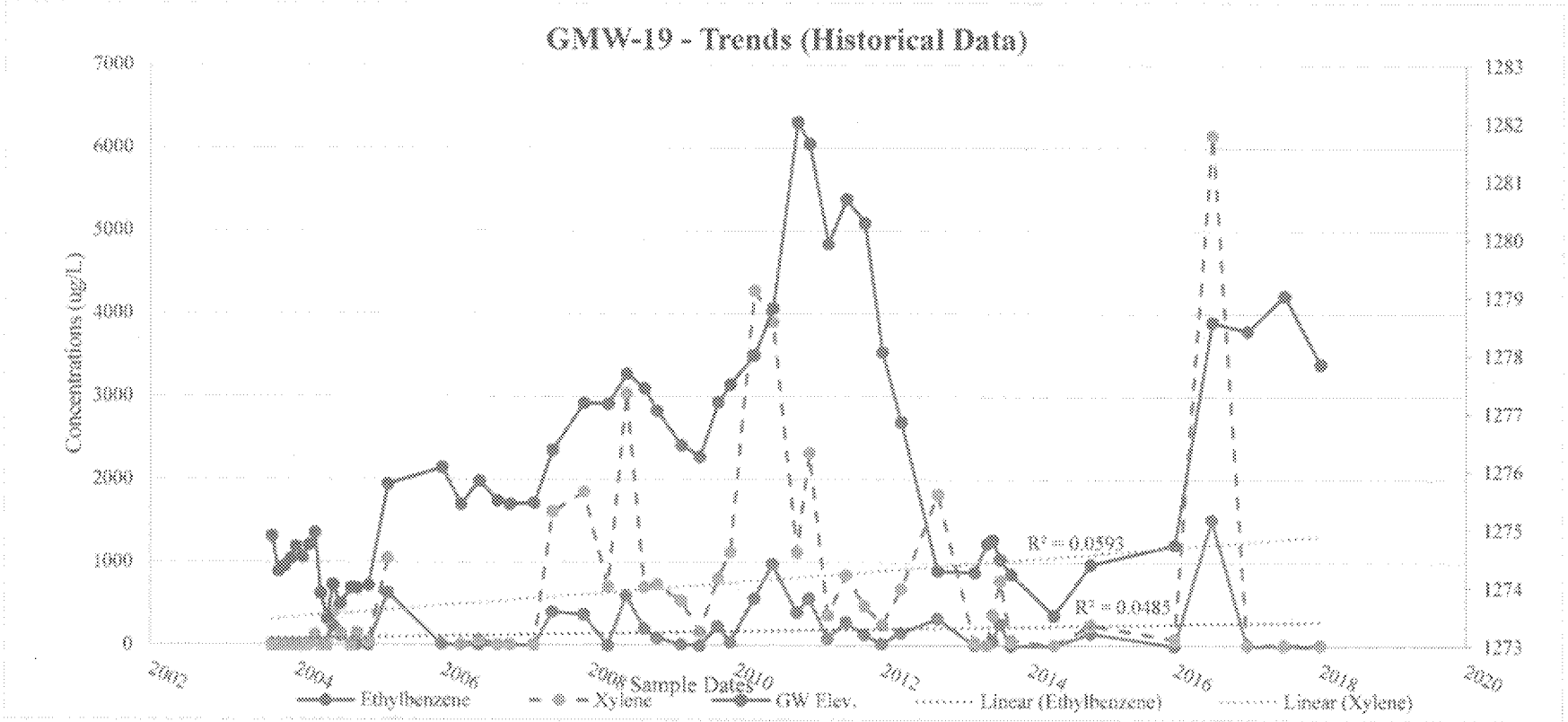

GMW-15 - Trends (5 - Year Data)
Natural Log - Concentrations (ug/L)
100000
10000
1000
100
10
1
1281
1280
1279
1278
1277
1276
1275
1274
1273
R² = 0.065
R² = 0.08
2013
2014
2015
2016
2017
2018
2019
Date
Ethylbenzene
Xylenes
GW Elev.
Linear (Ethylbenzene)
Linear (Xylenes)

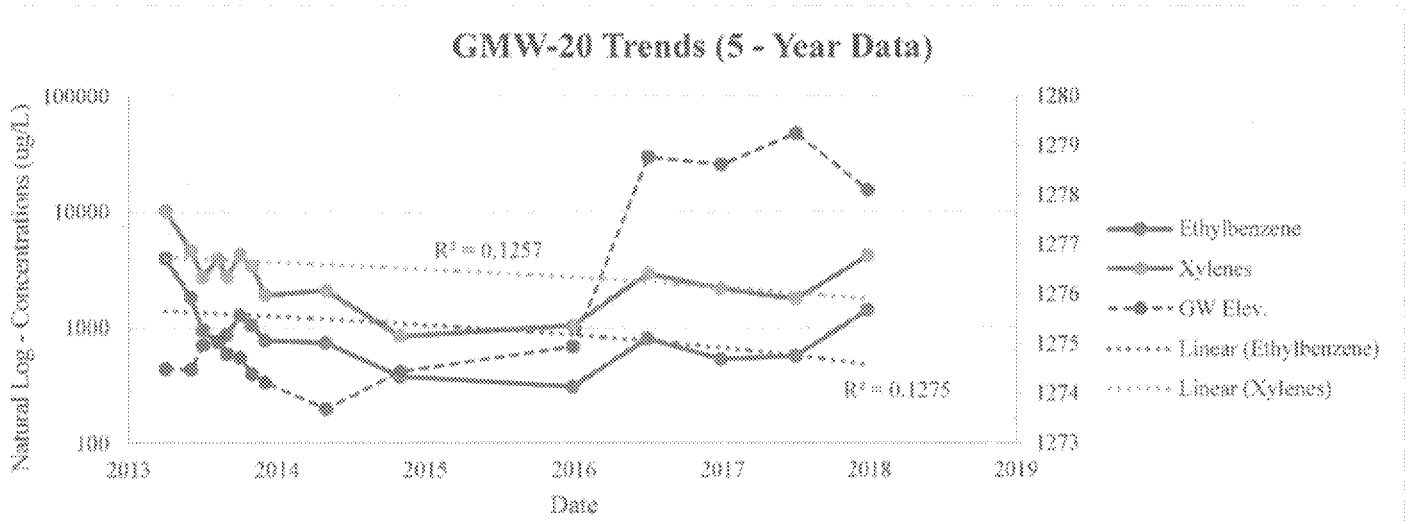

GMW-15 - Trends (Historical Data)
Concentrations (ug/L)
35000
30000
25000
20000
15000
10000
5000
0
1283
1282
1281
1280
1279
1278
1277
1276
1275
1274
1273
R² = 0.1012
R² = 0.0042
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Sample Dates
Ethylbenzene
Xylenes
GW Elev.
Linear (Ethylbenzene)
Linear (Xylenes)

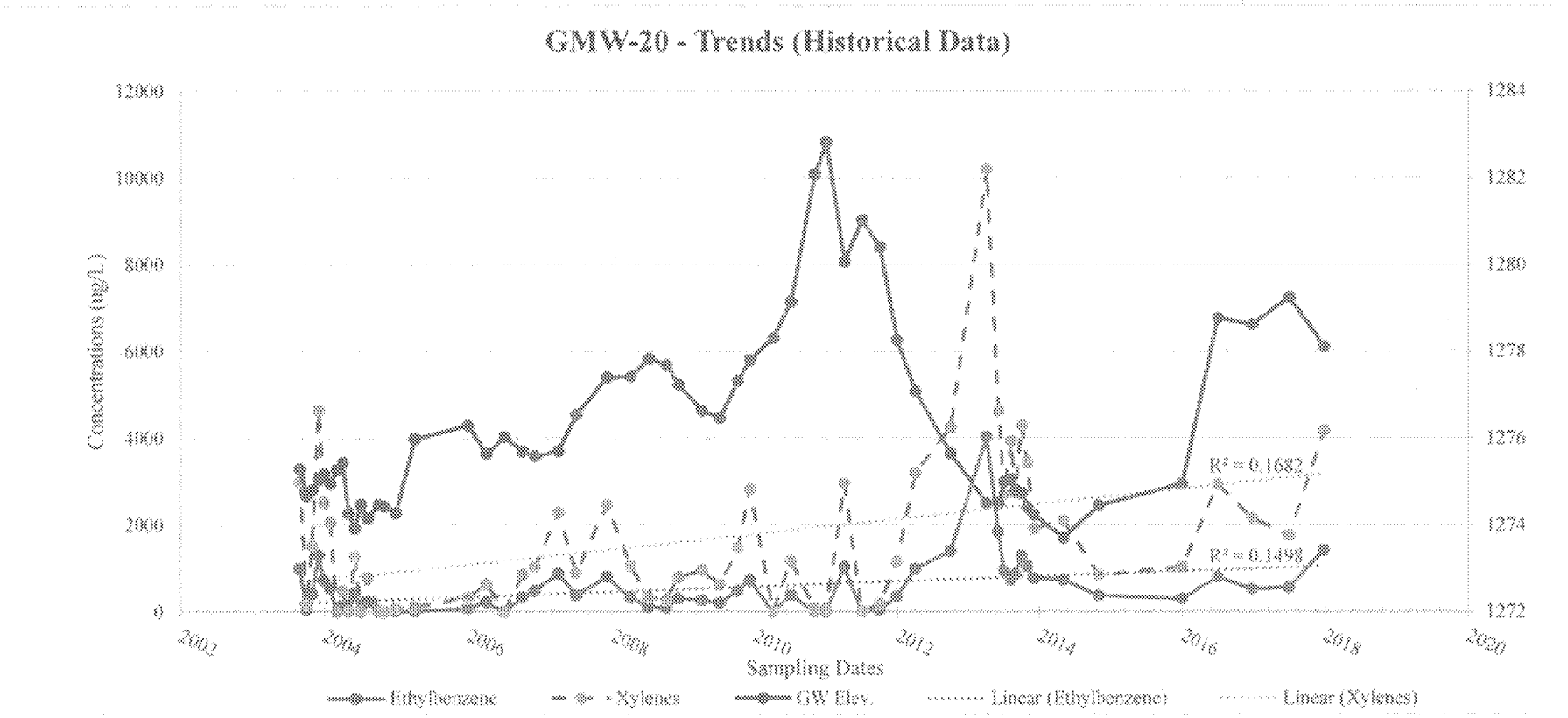

GMW-7R Trends (5 - Year Data)
Natural Log - Concentrations (ug/L)
100000
10000
1000
100
1280
1279
1278
1277
1276
1275
1274
1273
2013
2014
2015
2016
2017
2018
2019
Date
R² = 0.5368
R² = 0.4084
Ethylbenzene
Xylenes
GW Elev.
Linear (Ethylbenzene)
Linear (Xylenes)

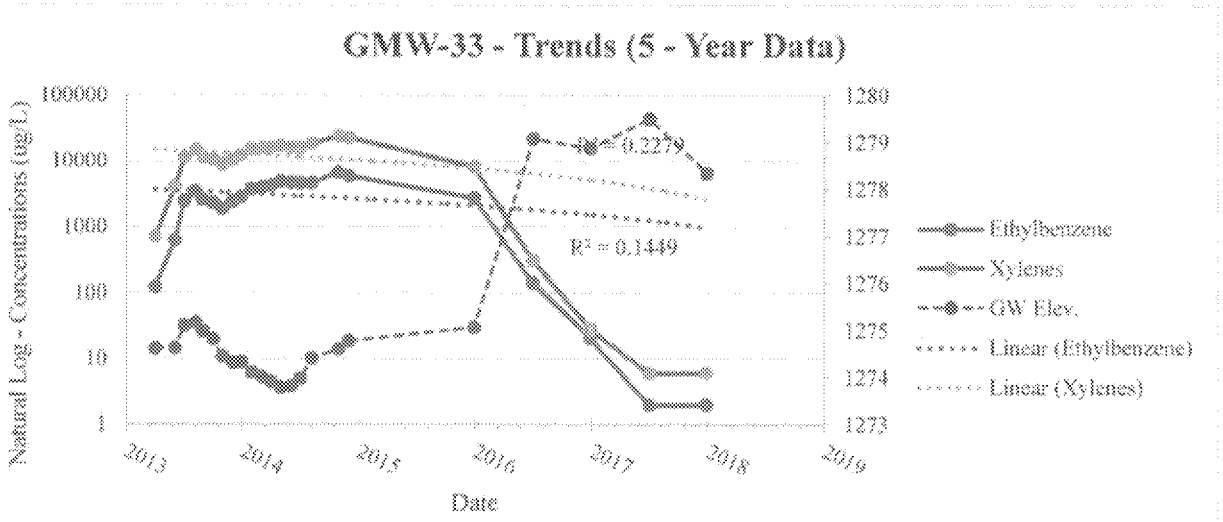

GMW-7R - Trends (Historical Data)
Concentrations (ug/L)
25000
20000
15000
10000
5000
0
1283
1282
1281
1280
1279
1278
1277
1276
1275
1274
1273
2003
2005
2007
2009
2011
2013
2015
2017
2019
Sample Dates
R² = 0.2235
R² = 0.1114
Ethylbenzene
Xylenes
GW Elev.
Linear (Ethylbenzene)
Linear (Xylenes)

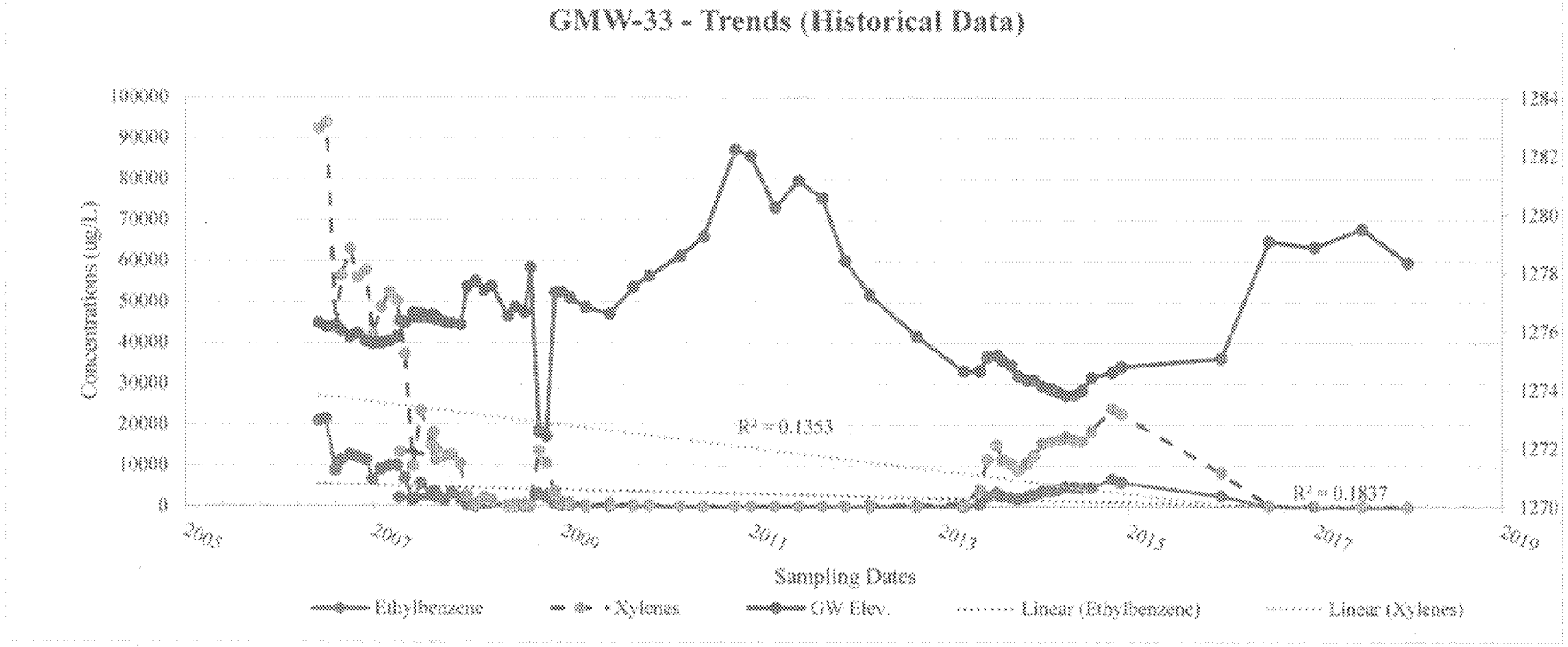

GMW-19 - Trends (5 - Year Data)
Natural Log - Concentrations (ug/L)
10000
1000
100
10
1
1280
1279
1278
1277
1276
1275
1274
1273
R² = 0.0366
R² = 0.0321
2013
2014
2015
2016
2017
2018
2019
Date
Ethylbenzene
Xylene
GW Elev.
Linear (Ethylbenzene)
Linear (Xylene)

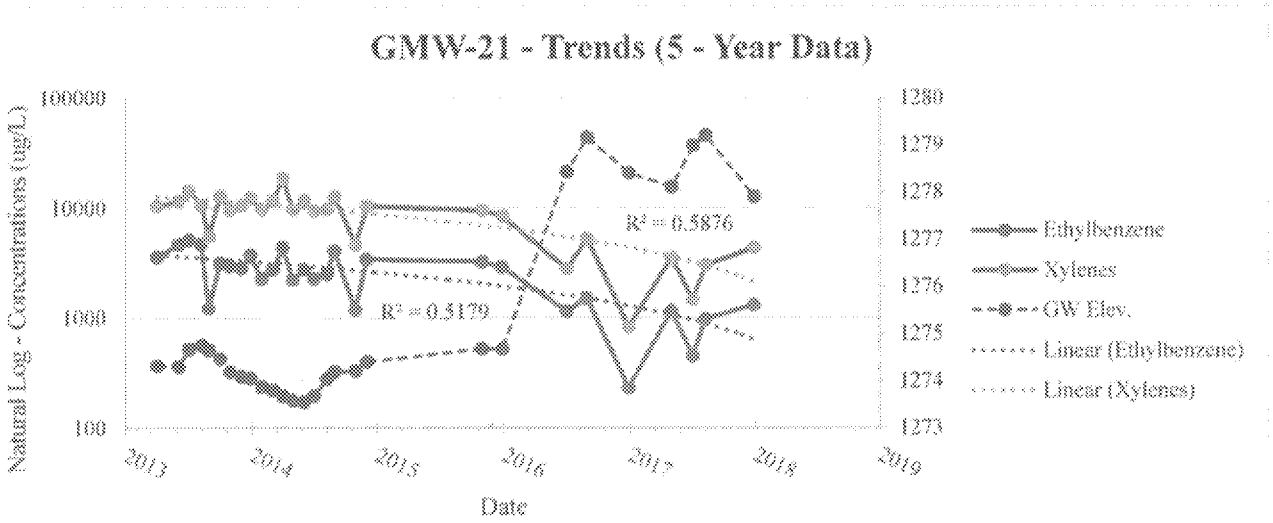

GMW-19 - Trends (Historical Data)
Concentrations (ug/L)
7000
6000
5000
4000
3000
2000
1000
0
1283
1282
1281
1280
1279
1278
1277
1276
1275
1274
1273
R² = 0.0593
R² = 0.0483
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Sample Dates
Ethylbenzene
Xylene
GW Elev.
Linear (Ethylbenzene)
Linear (Xylene)

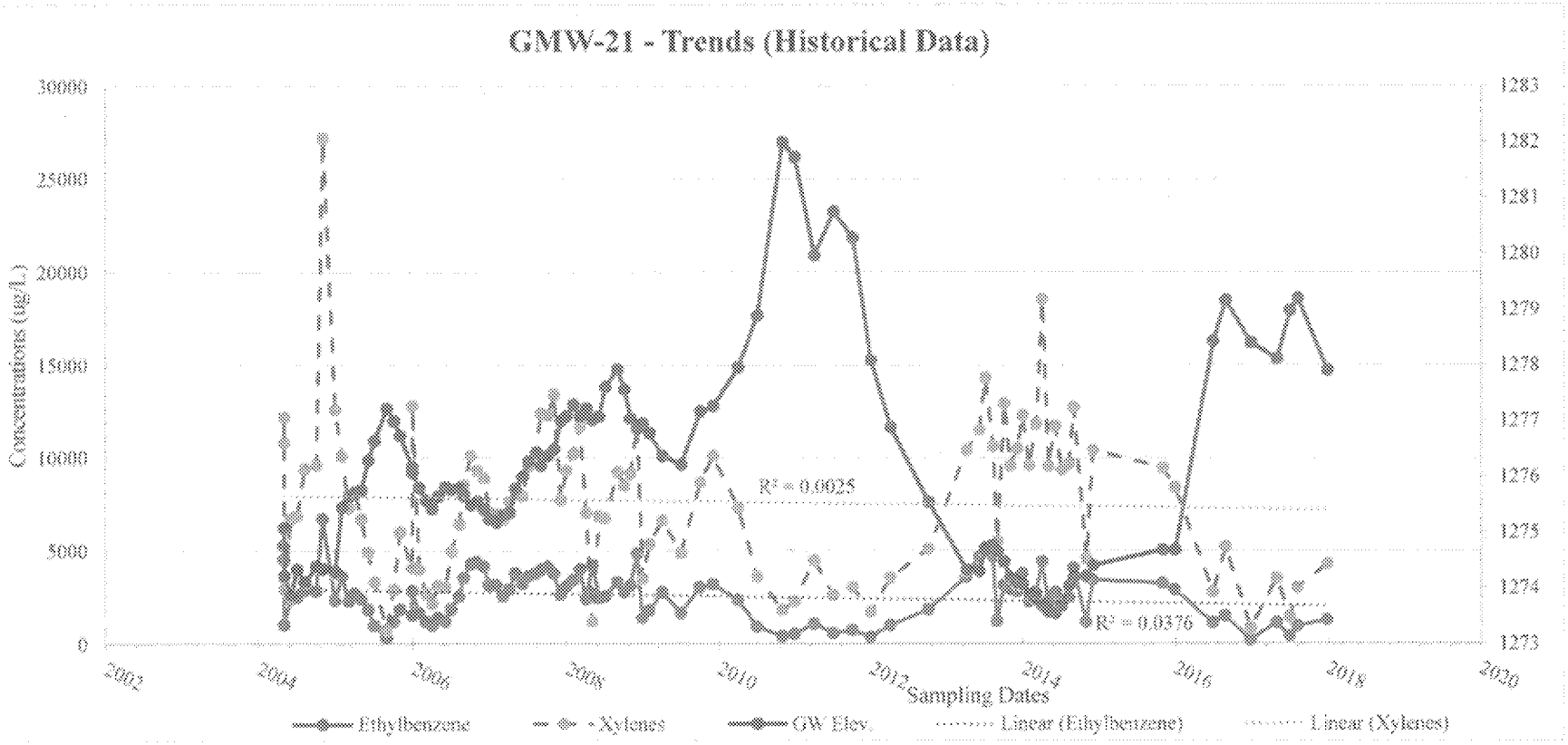

GMW-20 Trends (5 - Year Data)
Natural Log - Concentrations (ug/L)
100000
10000
1000
100
1280
1279
1278
1277
1276
1275
1274
1273
2013
2014
2015
2016
2017
2018
2019
Date
R² = 0.1257
R² = 0.1275
Ethylbenzene
Xylenes
GW Elev.
Linear (Ethylbenzene)
Linear (Xylenes)

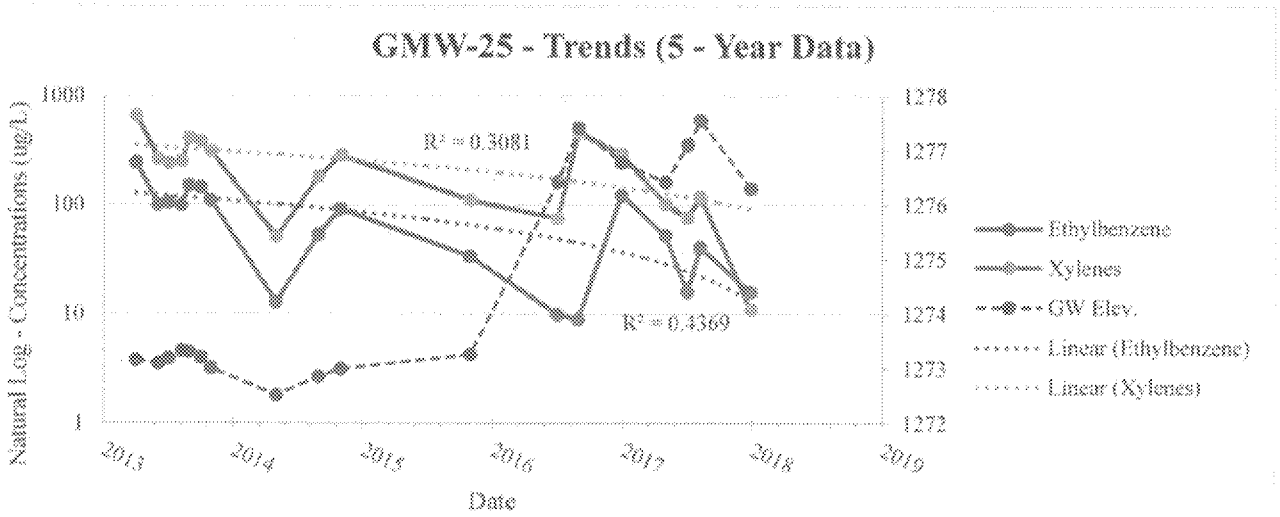

GMW-20 - Trends (Historical Data)
Concentrations (ug/L)
12000
10000
8000
6000
4000
2000
0
1284
1282
1280
1278
1276
1274
1272
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Sampling Dates
R² = 0.1682
R² = 0.1498
Ethylbenzene
Xylenes
GW Elev.
Linear (Ethylbenzene)
Linear (Xylenes)

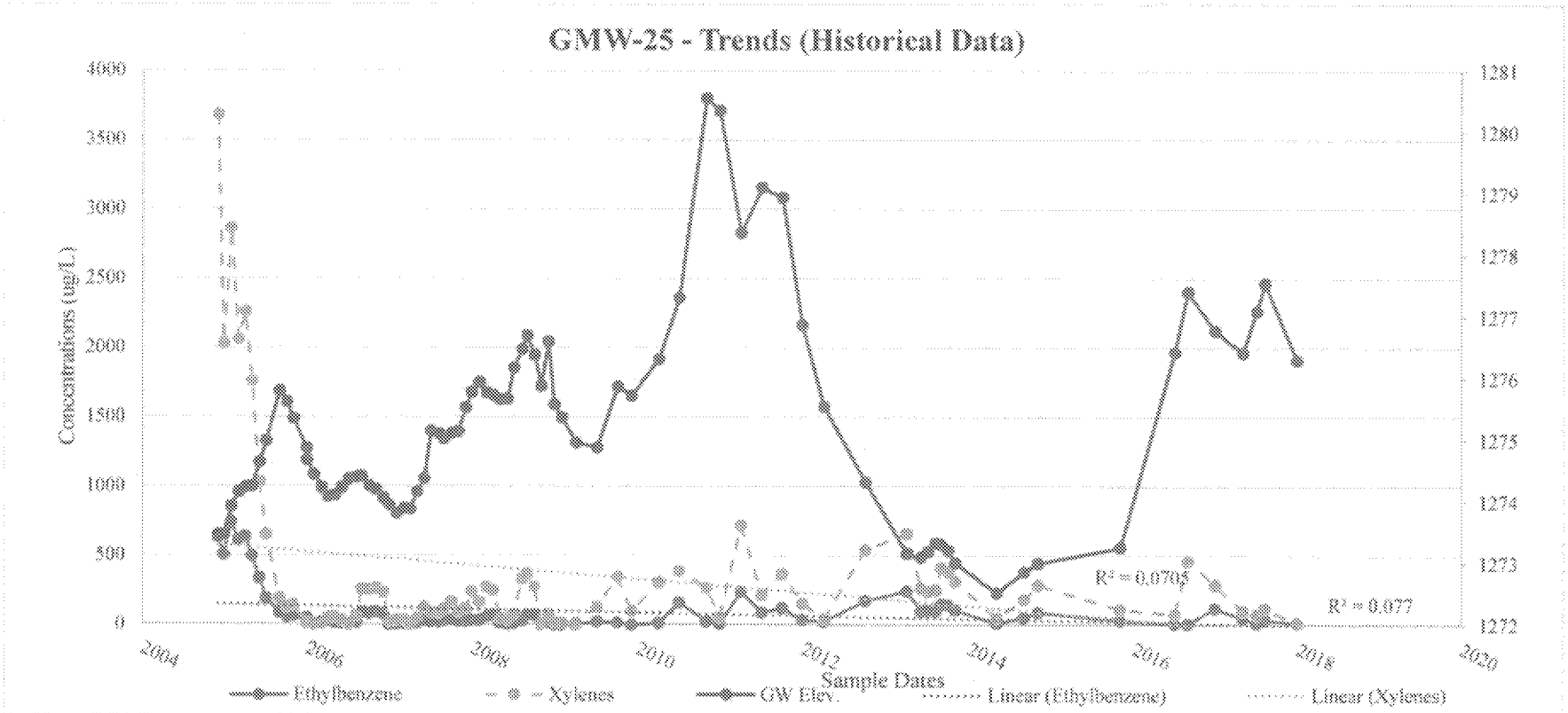

GMW-33 - Trends (5 - Year Data)
Natural Log - Concentrations (ug/L)
100000
10000
1000
100
10
1
1280
1279
1278
1277
1276
1275
1274
1273
2013
2014
2015
2016
2017
2018
2019
Date
R² = 0.2279
R² = 0.1449
Ethylbenzene
Xylenes
GW Elev.
Linear (Ethylbenzene)
Linear (Xylenes)

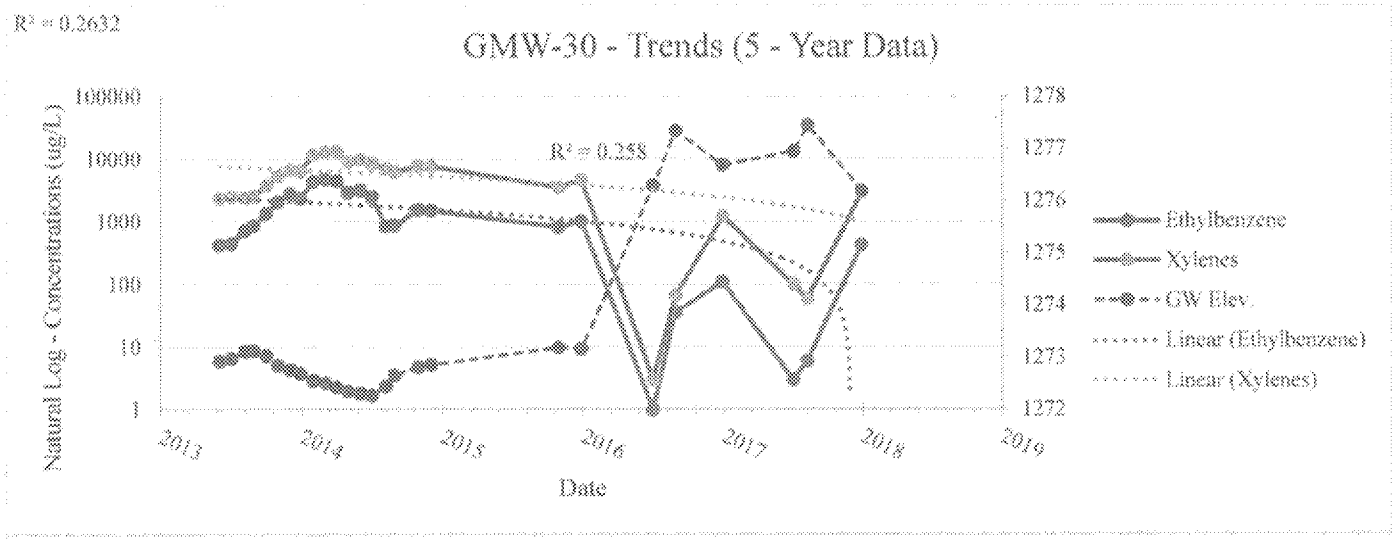

GMW-33 - Trends (Historical Data)
Concentrations (ug/L)
100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
1284
1282
1280
1278
1276
1274
1272
1270
2005
2007
2009
2011
2013
2015
2017
2019
Sampling Dates
R² = 0.1353
R² = 0.1837
Ethylbenzene
Xylenes
GW Elev.
Linear (Ethylbenzene)
Linear (Xylenes)

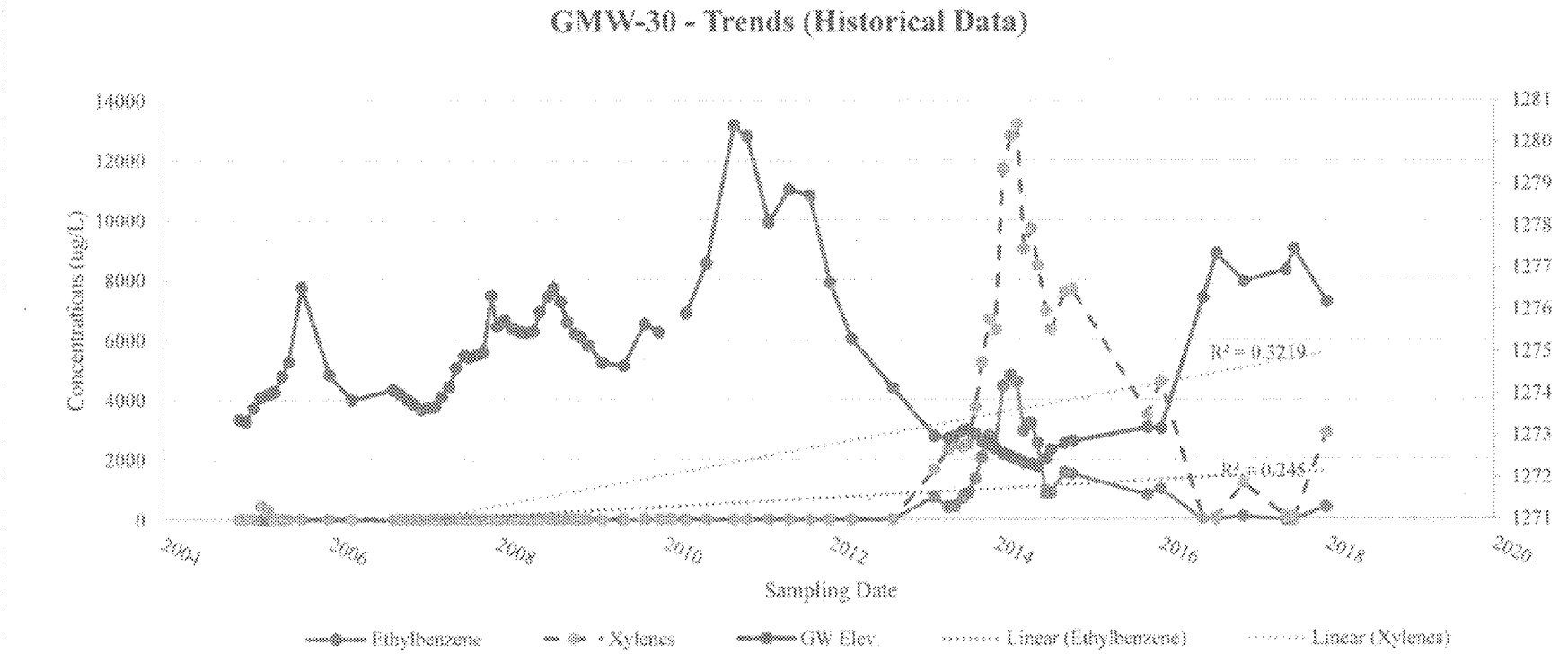

GMW-21 - Trends (5 - Year Data)
Natural Log - Concentrations (ug/L)
100000
10000
1000
100
1280
1279
1278
1277
1276
1275
1274
1273
2013
2014
2015
2016
2017
2018
2019
Date
R² = 0.5876
R² = 0.5179
Ethylbenzene
Xylenes
GW Elev.
Linear (Ethylbenzene)
Linear (Xylenes)


GMW-21 - Trends (Historical Data)
Concentrations (ug/L)
30000
25000
20000
15000
10000
5000
0
1283
1282
1281
1280
1279
1278
1277
1276
1275
1274
1273
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Sampling Dates
R² = 0.0025
R² = 0.0376
Ethylbenzene
Xylenes
GW Elev.
Linear (Ethylbenzene)
Linear (Xylenes)


GMW-25 - Trends (5 - Year Data)
Natural Log - Concentrations (ug/L)
1000
100
10
1
1278
1277
1276
1275
1274
1273
1272
R² = 0.3081
R² = 0.4369
2013
2014
2015
2016
2017
2018
2019
Date
Ethylbenzene
Xylenes
GW Elev.
Linear (Ethylbenzene)
Linear (Xylenes)


GMW-25 - Trends (Historical Data)
Concentrations (ug/L)
4000
3500
3000
2500
2000
1500
1000
500
0
1281
1280
1279
1278
1277
1276
1275
1274
1273
1272
R² = 0.0705
R² = 0.077
2004
2006
2008
2010
2012
2014
2016
2018
2020
Sample Dates
Ethylbenzene
Xylenes
GW Elev.
Linear (Ethylbenzene)
Linear (Xylenes)


R² = 0.2632
GMW-30 - Trends (5 - Year Data)
Natural Log - Concentrations (ug/L)
100000
10000
1000
100
10
1
R² = 0.258
1278
1277
1276
1275
1274
1273
1272
2013
2014
2015
2016
2017
2018
2019
Date
Ethylbenzene
Xylenes
GW Elev.
Linear (Ethylbenzene)
Linear (Xylenes)


GMW-30 - Trends (Historical Data)
Concentrations (ug/L)
14000
12000
10000
8000
6000
4000
2000
0
R² = 0.3219
R² = 0.245
1281
1280
1279
1278
1277
1276
1275
1274
1273
1272
1271
2004
2006
2008
2010
2012
2014
2016
2018
2020
Sampling Date
Ethylbenzene
Xylenes
GW Elev
Linear (Ethylbenzene)
Linear (Xylenes)

APPENDIX I
DEED NOTICE

3510
3510

RECORDED
SIOUX COUNTY IOWA

2014 AUG 18 AM 8 56

FILE 2014 CARD 3510
Anita K. Van Brugge
A VAN BRUGGEN RECORDER

Prepared by: Jon C. Tack, Wallace State Office Bldg., Des Moines, IA 50319-0034; Ph: 515/281-8971

NOTICE

The director of the Department of Natural Resources hereby provides notice of reclassification in regard to the real property owned by Vogel Paint & Wax Co., Inc. which is legally described as:

Section 29, T94N, R45W, in Sioux County, Iowa.

which was placed on the registry of hazardous wastes or hazardous substances disposal sites on or before December 5, 1984. The director has determined that closure activities have been completed and that the site is now properly classified pursuant to Iowa Code section 455B.427 as **"d" - site properly closed-requires continued management.**

This reclassification occurred on August 20, 2003 upon the issuance by the Department of an Amended Notice of Intent to Reclassify Property on Registry of Confirmed Abandoned or Uncontrolled Disposal Sites.

Be advised that use of this property may not be changed substantially, nor may this property be sold, conveyed or transferred without the written approval of the director, pursuant to Iowa Code section 455B.430(2).

Questions regarding this Notice may be directed to the Department of Natural Resources, 900 East Grand Avenue, Henry A. Wallace Building, Des Moines, Iowa 50319-0034.

Chuck Gipp

CHUCK GIPP, DIRECTOR
IOWA DEPARTMENT OF NATURAL RESOURCES

Dated this 12th day of August, 2014

STATE OF IOWA)
) ss:
COUNTY OF POLK)

On this 12 day of August, 2014, before me, a notary public in and for said county, personally appeared Chuck Gipp who stated that he is the duly appointed and acting director of the Iowa Department of Natural Resources, and that he was authorized to execute the foregoing on behalf of the Iowa Department of Natural Resources pursuant to Iowa Code section 455B.431.

KAREN FYNAARDT
COMMISSION NO. 188249
MY COMMISSION EXPIRES
JANUARY 13, 2015

Karen Fynaardt

NOTARY PUBLIC – STATE OF IOWA